REGENERATING SUDBURY'S SOCIO-URBAN LANDSCAPE Through Adaptive Reuse

By
Nathan Sorli

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The Faculty of Graduate Studies
Laurentian University
Sudbury, Ontario, Canada

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APPROVED/APPROUVÉ

Thesis Examiners/Examinateurs de thèse:

Dr. Aliki Economides
(Thesis Advisor / Directeur(trice) de thèse)

Dr. Izabel Amaral
(Thesis Second Reader / Directeur(trice) de thèse deuxième)

Mr. Brian Lilley
(External Examiner/Examinateur(trice) externe)

Approved for the Faculty of Graduate Studies
Approuvé pour la Faculté des études supérieures
Dr. David Lesbarrères
Monsieur David Lesbarrères
Dean, Faculty of Graduate Studies
Doyen, Faculté des études supérieures

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ABSTRACT

A common issue faced by de-industrializing cities worldwide is the abundance of obsolete industrial buildings. These are often part of derelict zones that aggravate the urban challenges of unsafe neighbourhoods, socioeconomic segregation, and environmental degradation. By reviving these defunct buildings through carefully attuned strategies of adaptive reuse, there is an opportunity to address the needs of diverse users within the local community by sustainably regenerating the built environment in physical, ecological, cultural, and socioeconomic terms. Through the adaptive reuse of the derelict Northern Brewery complex in downtown Sudbury (Ontario, Canada) into a brewpub and mixed income housing development, this thesis project offers a critical response to the city's high rates of homelessness and lack of affordable housing as well as its insufficient amount of public green space, while reconnecting citizens to the site's history and serving as a catalyst for further redevelopment projects.

KEYWORDS:

adaptive reuse, brewery, catalyst, collective memory,
community, mixed income housing, Northern Brewery,
re-greening, sociocultural sustainability, Sudbury,
urban revitalization

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THE URBAN LANDSCAPE

Thesis Statement

Numerous cities around the world were once dominated by vast industries, but as natural resources depleted, and the advancement of technologies increased these businesses declined leaving behind immense, vacant factories. These unoccupied sites have contributed to urban challenges, such as unsafe neighbourhoods, socioeconomic segregation, and environmental degradation. These obsolete vestiges of cities' industrial pasts materially decompose, they tend to physically divide urban spaces, and they are often used illegally. To create a community that enjoys a decent quality of life, has access to safe walking paths, and has opportunities for meaningful experiences within the surrounding area, these decrepit buildings must be revived. By regenerating these defunct buildings through adaptive reuse their immediate sites and their vicinity will be enhanced and will contribute to further regenerating the built environment in ecological, material, cultural, and socioeconomic terms.

The point of departure for this work is the assessment of the city of Sudbury and the problems with, and potential of, the site known as the former Northern Brewery, which stands a large, abandoned industrial complex located between rail yards and a residential neighbourhood in downtown Sudbury. This thesis advances a critical evaluation of the city's various environmental and socioeconomic struggles and proposes adaptive strategies to be applied to regenerate the Northern Brewery complex, which in turn can serve as a catalyst for other sites in Sudbury and by extension, as an example for other cities suffering from similar social, environment, and cultural problems. Currently, Sudbury is contending with a lack of affordable housing, which has been contributing to high rates of homelessness, in conjunction with insufficient public green space. Responding to these realities, this thesis project envisions adapting the Northern Brewery to accommodate a hybrid programme comprised of an income-generating microbrewery with brewpub and mixed-income residential complex. The adaptive reuse intervention also comprises designed green spaces that serve residents, visitors, and the surrounding community, thereby transforming the currently derelict industrial complex that stands as a barrier between industrial and residential zones, into a vibrant place of connection and collective well-being while also enhancing residents' collective memory of the city's industrial past.

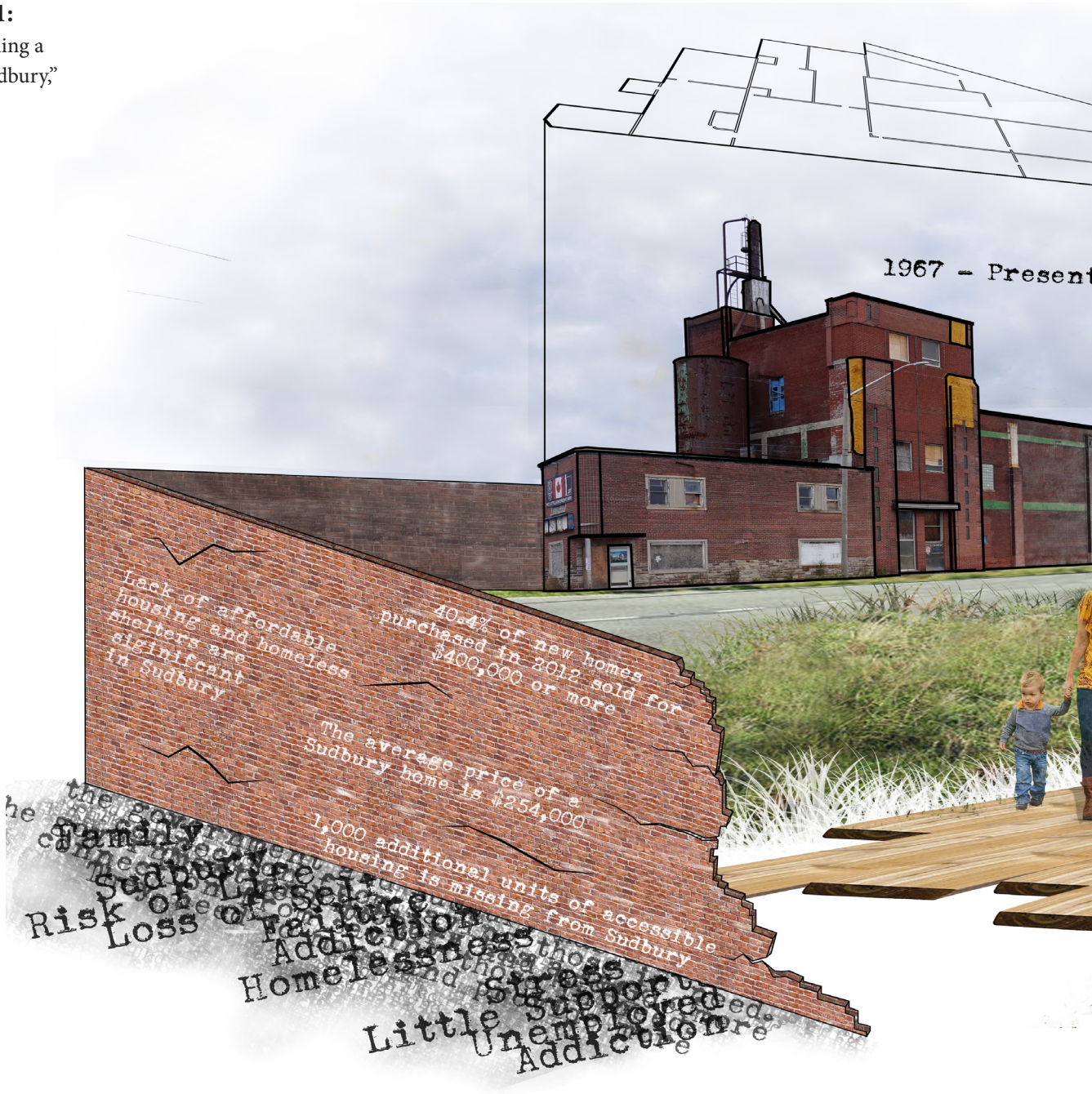
In order for the revitalization of Sudbury to occur, a far-reaching agenda for adaptive reuse must be first implemented to connect derelict industrial sites to their past and reframe their relevance to the present and future. The adaptive reuse strategy that is being proposed for the Northern Brewery site takes its inspiration from the term 'collective'. The idea of drawing on and reflecting the history, materials, original programme and collective memory of the site influences every architectural move made throughout the building and guides the determination of what is to be preserved, destroyed, subtly modified or added. Moreover, emphasis on how the adaptive reuse of the complex will serve the collective, drives programmatic decisions about the design of green spaces and communal facilities. By consciously connecting the building to both the communities of the past and present, the historical value and renewed relevance of the Northern Brewery is prioritized. This connection will also allow the public to appreciate the transformation of the structure, while bringing together diverse groups of people through its hybrid programme.

Through the adaptive reuse of obsolete buildings like the Northern Brewery, into spaces that contribute to meeting the needs of the city, there is an opportunity to positively transform the perception of an area, which in turn will not only stimulate population growth in Sudbury's downtown, but will valorize the community and stimulate further development in the surrounding area.

Mythological Drawing of the Site's History and the Thesis Project's Aspirations

This drawing depicts the transition that has occurred on the site at Lorne Street since the opening of the Northern Brewery in 1907 in tandem with the rise of socioeconomic and environmental issues that affect Sudbury. As the brewery expanded throughout the years so did Sudbury's population and economy. But as Sudbury entered the 21st century the brewery went bankrupt and many other businesses decayed alongside it.

Figure 1:
"Envisioning a Better Sudbury," collage.



Today, there is a significant disconnect in Sudbury between the realities of the city's socio-economic landscape and optimal requirements for healthy living. By literally and metaphorically breaking down walls, an improved quality of life will become accessible to a greater number of people. The opportunity here is to transform one of many neglected and under-estimated sites into an accessible, vibrant community hub that also contributes to the city's intentions for re-greening the downtown.

General Context

It is a general condition that the industrial era necessitated the construction of many new buildings to meet the quickly expanding needs of industry. However, by the late 20th and early 21st centuries, as technology developed and the dynamics of industrial cities transformed, many spaces of industrial production became outmoded. As a result, numerous large industrial complexes have become obsolete, vacant, and/or abandoned. Consequently, there are a vast number of unused factories, warehouses, mills, depots, and breweries that dot urban landscapes in many parts of the world. These derelict buildings stand as reminders of the communities that developed around them but in their current state, contribute to the social and environmental degradation of their surroundings.

These buildings are unwelcoming as they are often deteriorating physically and are an eyesore for onlookers. Standing uninhabited and deteriorating, these large structures can create visual, physical and psychological barriers between urban spaces and individuals within a neighbourhood, thus, leaving people and resources disconnected from one another. This disconnection does not promote cultural or social exchange. Instead it contributes to the isolation and lack of interaction between diverse groups of people. Similarly, the deterioration of these buildings can pose an ecological and health threat as they often increase the number chemical and biological elements that seep into the area's air, soil and water sources. Through the combination of these factors, these buildings do not allow life to grow within or around them, and in turn thwart urban, community and ecological well-being.

Economically, these decrepit industrial buildings do not provide many opportunities for monetary gain. They are structures that are utilizing resources with no reward. It has also been recognized that these buildings take away from the economy and safety of an area as they provide spaces for criminal activities, such as vandalism, theft, graffiti, drug sales and prostitution.[1] A higher crime rate is one symptom of disinvestment in the area and can decrease the sociocultural and monetary value of the area, impacting on its desirability in the eyes of prospective inhabitants.[2] As a result, these structures contribute significantly to a socioeconomic downward spiral: less investment creates poorer living conditions alongside cheaper rent, which in turn increases the number of low-income households. This demonstrates the main problem with vacant industrial

buildings: they increase the likelihood for "one vacant building to become a vacant block, [and] one vacant block [to become] a vacant community."[3]

Yet despite these problems, these buildings do provide promising opportunities for the present and the future of their surrounding community. As windows into the local and industrial history of the area, if skillfully regenerated through adaptive reuse, they can assist in the growth of the neighbourhood rather than its deterioration.

The History and Current Conditions of Sudbury

The city of Sudbury was officially established in 1883 as a depot for the Canadian Pacific Railway (CPR) that would eventually traverse all of Canada.[4] By 1885, the city began to develop new industries, such as timber and mining, in order to support the demand of the quickly growing population.[5] Due to the spatial division caused by the railway tracks and yards, the deforestation of trees, and the chemicals found in the air and water from metal extraction, the area became an undesirable location for habitation. Given the overall contamination of the urban landscape, Sudbury gained the horrible reputation of being one of the most unappealing city centers in all of Canada.[6] In response, in 1973, Sudbury began to transform its urban landscape by planting over one million trees and instituting an environmental rehabilitation programme. This message of positive environmental change has continued for decades, including a shift towards more investment in city growth that is sustainable and efficient.[7]

Today, the city is still known as a mining town, but has shifted into an area for modern development of mining techniques and similar technologies. Combined with Sudbury's transformation into an educational hub, this has generated vivacious growth in cultural and social activity.[8] However, the addition of universities, colleges, scientific labs and the hospital outside of the downtown core has encouraged the population to shift from the Sudbury's downtown to the outskirts of the city, setting up the condition in which people have less need to visit downtown. In Sudbury, suburban areas are thriving more than the urban core, which runs counter to the desire of the city as it leads to less connectivity and accessibility between people and resources.[9]

Overall, there is a vast difference between the upper class and lower class due to the technological and educational boom within the last several years. This has resulted in people in a lower income bracket residing closer to downtown, while more affluent inhabitants choose to be located on waterfront property or on the outskirts of Sudbury as the more expensive homes in these areas feature larger plots of lands, better resources, and better scenery.[10] This divide has led to a less prosperous downtown with the area suffering from high levels of poverty and homelessness.[11] The apparent spatial shift related to socioeconomic standing has resulted in the neighbourhood adjacent to the Northern Brewery having a large quantity of housing that is valued as less than the average housing market.

Images of Northern Brewery, Sudbury

Left Images

Figure 2: West Elevation.
Figure 3: Interior arch.
Figure 4: Brick detail.

Middle Images

Figure 5: Brewery stack.
Figure 6: Light installation.
Figure 7: Ceiling detail.

Right Images

Figure 8: Brick detail 2.
Figure 9: Crumbling wall material.
Figure 10: Beer roll elevator cage.

Analysis of Sudbury's Economy

Affordable Housing and Homeless Shelter Plan

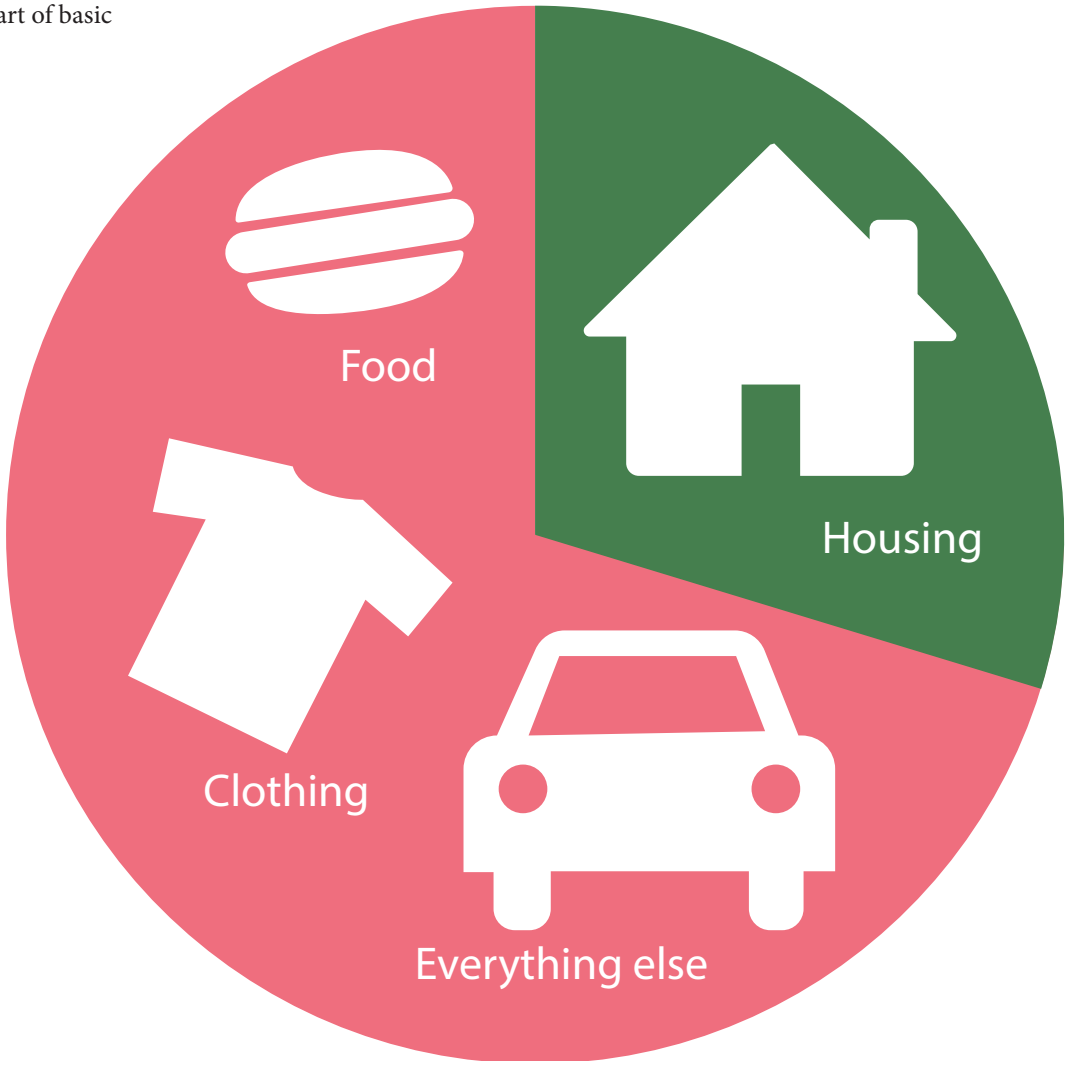
Through my research, I have understood that several interconnected issues have held Sudbury back from growing as a whole. These include a lack of: student housing in the downtown; aging-in-place housing; affordable housing; and homeless shelters. After extensive research into each of these needs to determine the optimal programme for this thesis project, affordable housing emerged as offering the best opportunity to support the needs of Sudbury, particularly in the west end of downtown.

In 2013, the City of Greater Sudbury drafted a document titled, "Affordable Housing and Homelessness Background Study" which investigated, identified and analyzed the issue of homelessness that needs to be addressed by the City, and recommended a plan for affordable housing in Sudbury. The homelessness population as of August 2015, was 1,419, which is very high. The number one issue held by those with lower incomes was the inability to pay rent.[12] As a result, the top priority issues that were to be addressed included the insufficient supply of accessible housing, limited diversity in available housing options, affordable accommodation for students, poor conditions in rental housing, lack of support services related to housing (such as those for seniors), and the abundance of economically inaccessible housing.[13] Overall, the study argued that there is a need in Sudbury to improve overall housing access and affordability for individuals and families, as 39% of Greater Sudbury tenants suffer from affordability issues.[14]

Within the vicinity of the Northern Brewery there are a significant number of individuals whose income reflects some of the lowest in the city. The creation of an affordable housing project can thus assist those to get back on their feet and in turn help the economy flourish. As well, the city has stated that there is a need to strengthen approaches to preventing homelessness, through increasing the diversity of emergency shelter options, and supporting individuals with multiple barriers in obtaining and maintaining their housing, such as housing that is reasonably priced in order to bridge the gap between economic rent and affordable rent.[15] This initial study provided a first look into the needs of the city, but still does not answer how the increase of affordable housing and prevention of homelessness can occur simultaneously. For programmes like these to be successful in Sudbury there needs to be a more detailed analysis of how the city can assist developers and regulate these buildings and create public spaces that positively affect the residents in the area and the city at large.

What is Affordable Rental Housing?

Figure 11:
Pie chart of basic needs.



Affordable rental housing is, the least expensive of:

a. A unit for which the rent does not exceed 30% of the gross annual household income for low income households; or

b. A unit for which the rent is at or below the average rent of a unit in the regional market area.

Green Space and Surrounding Programmes

This site model calls attention to the existing amenities and public programmes that are to be found within close proximity to the Northern Breweries site, such as parks, an elementary school, a large grocery store and recreational facilities. The opportunity here is to draw out the full potential of what is already nearby, by reviving the site and creating an inclusive space that will contribute much to strengthening the neighbourhood.

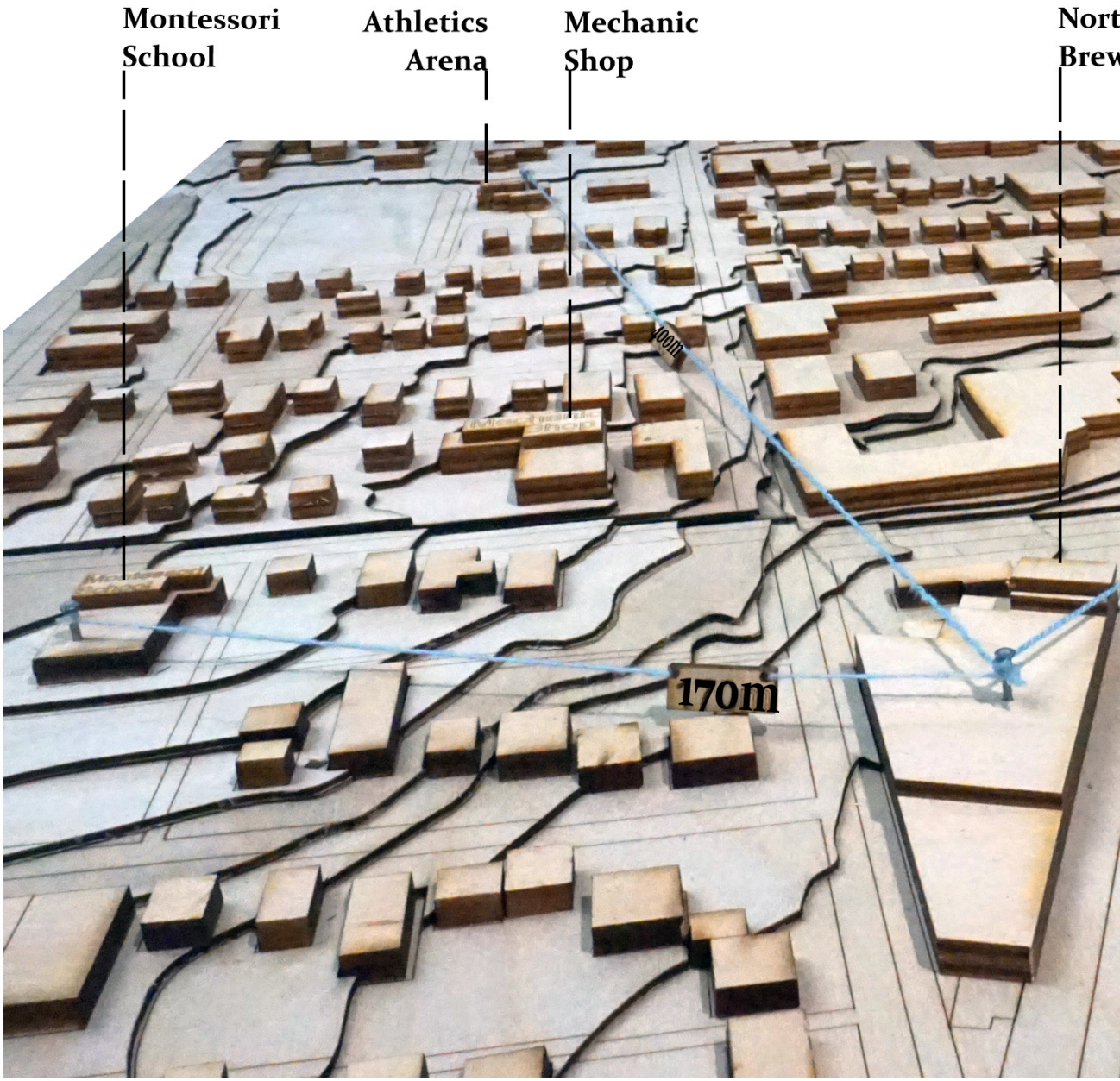
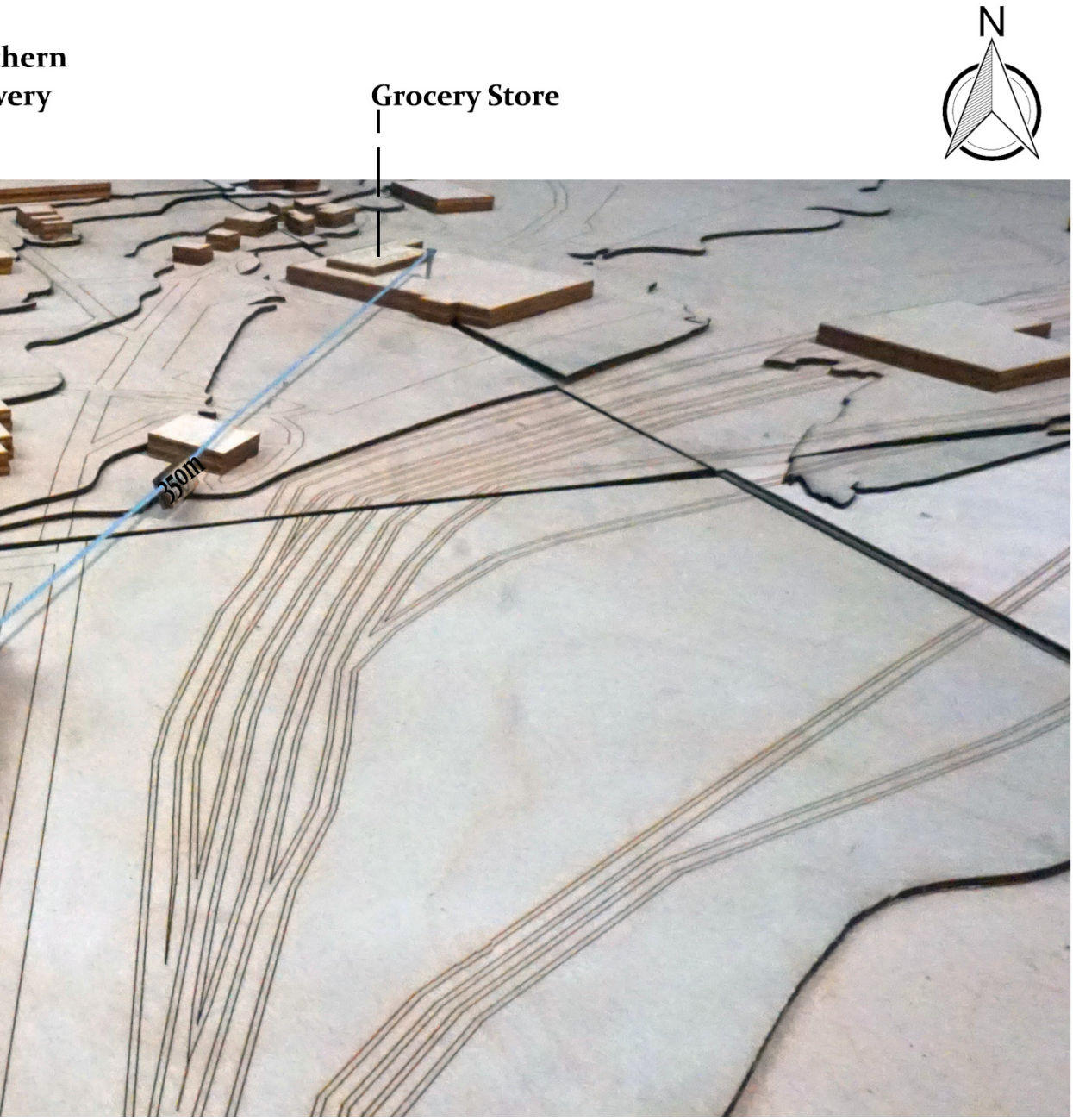


Figure 12:
Model showing the existing amenities within close proximity to the Northern Brewery site in Sudbury.



City of Sudbury Master Plan

Within Sudbury's downtown core there is an overarching need to create a space that is more desirable for the public. Authorities at the City of Greater Sudbury have noted the need for increased circulation within the city's downtown. As a result, the City drafted an executive summary titled, "Downtown Sudbury a Plan for the Future: Going Downtown, Growing Downtown," in which the value of downtowns are highlighted as they are the historic and symbolic heart of a community, and the reflection of a city's image, pride and prosperity. Downtown is the meeting place for the entire city, where different people come together to share common experiences. Downtown Sudbury needs to become a destination in its own right as a place of celebration, beauty, creativity, and innovation, as well as a centre for urban living.[16] Overall, in order for the city to thrive, the downtown needs to send a positive message to future residents, businesses and investors.[17]

Figure 13a:
Diagram of Sudbury's main goals to revitalize the downtown core.

Figure 14: Rendering of Elm Street, Sudbury.

In order to create a successful downtown, the City of Greater Sudbury has identified 52 sites to revitalize within the next 10 years. These sites include 15 new buildings to create successful activity and stimulate growth within the downtown.[18] In addition to this, the city looks to create 15 new roads and pathways to better connect the downtown with these sites. Finally, the city has identified 22 opportunities to re-green the area and revitalize the downtown as a whole.[19] However, as promising as all of this sounds, this plan for the city's re-greening, which was set out in 2012, has fallen short of meeting its target.

Figure 13b:
List of Sudbury's main goals to revitalize the downtown core.

Activity and Growth

01 Prestige Office Sites
02 Innovation - Technology Park
03 Rainbow Centre Improvements
04 Multi-Use Recreation & Conference Complex / Hotel
05 Mixed-Use Infill Opportunity Site *
06 Place des Arts (location TBD)
06 N'Swakamok Friendship Centre
07 Downtown Art Gallery (location TBD)
08 City of Sudbury Visitor Centre
09 Farmers' Market
10 Laurentian School of Architecture
11 Expansion of College Presence *
12 Contemporary Central Library (location TBD)
13 Residential Incentive Program *
14 Mixed-use Infill Opportunity Sites *
15 Residential Opportunity Sites *

Access and Connections

16 Larch Street Extension
17 Expansion of Cycle Network
18 Riverside Pedestrian Tunnel Upgrade
19 Nelson Bridge Upgrade
20 Cedar Street Pedestrian Bridge
21 Ste. Anne Extension and Cycle Route
22 Grey Street Pedestrian Connection
23 Beech Street Mews
24 Van Horne Street Realignment
25 West District Parkade
26 South District Parkade
27 Central District Parkade
28 Transit Terminal Relocation
29 District Energy Expansion *
30 Laneway Upgrade Strategy *

Beauty and Pride

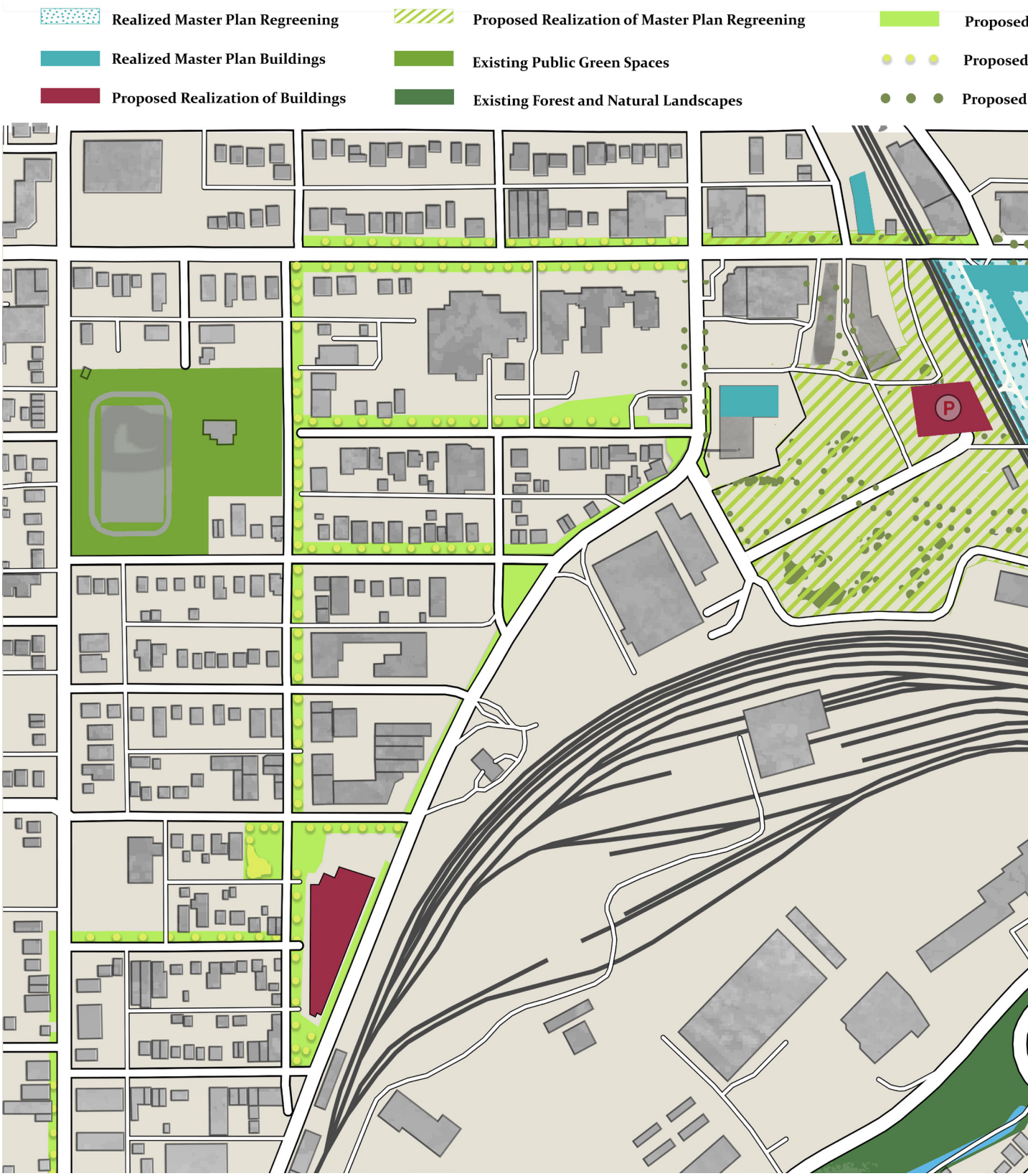
31 Elm Street Rebuild
32 Paris Street Beautification
33 Durham Street Upgrade / Shared Street
34 Brady Street Calming
35 Elgin Greenway
36 Memorial Park Expansion
37 Tom Davies Square Upgrade
38 Minto Civic Corridor / Shared Street
39 Station Plaza
40 Brady Green Stair
41 Parc des Pins
42 Downtown Greening Strategy *
43 Inno-Tech Common
44 Gateway Treatment
45 Carleton Street Park
46 Larch Street Plaza
47 Nelson Street Park
48 Monck Community Park
49 Public Art Strategy *
50 Heritage Strategy *
51 Historic Downtown Core Preservation *
52 Celebrate the Creek Water Features *


COLLEGE ST
ELM ST
LORNE ST
ELGIN ST
BRADY ST
P
study area
office
residential
mixed use
parking structure
cultural and institutional
hotel
open spaces
plazas
special street treatment
key pedestrian crossings
railyard relocation opportunity
celebrate the creek water feature
potential public art location

Figure 15:
Map of Sudbury's proposed plan for the downtown.

This image includes the revitalization
of old buildings, re-greening of open spaces and readapting pathways.

Thesis: Proposed Master Plan



After critically analyzing Sudbury's plan for downtown, it becomes clear that two main concerns still have not been met, namely, the re-greening of the walkway along Elgin Street which follows the train tracks, and creating a connection between the west and downtown. This map represents this thesis project's proposal for more pedestrian pathways on Elgin, which offers enough space for future festivals and other community events, thereby providing the infrastructure for more activities in the downtown core. This in turn, may indirectly contribute to increasing Sudbury's population density by helping to make the downtown a more vibrant and enjoyable place to be. Also, not discussed in the City's plan for downtown are the benefits of adding a parking garage, as well as more public programmes and green spaces in between these two areas to strengthen the ability and desire to walk from one end of the downtown to the other. With the creation of affordably priced rental units in the renovated Northern Brewery complex along with enhanced public green space, this part of Lorne Avenue can contribute significantly to redefining the depressed area and cultivating a greater connection to Sudbury's downtown core.

Figure 16:
Proposed Thesis Master Plan.

Critical Response

This thesis broaches the various ways in which Sudbury is lacking as an inclusive and healthy urban environment. The city is stunted in its growth, as there is very little annual expansion, new development, and/or newly created public green spaces, which in turn is reflected in the city's stunted population growth. The number of inhabitants in Sudbury is not increasing as dramatically as projected, even with the addition of post-secondary institutions which typically, stimulate population growth. As well, those living in the area are suffering. There are higher numbers of people living at or below the poverty line coupled with high levels of homelessness, which are localized around the downtown core.

Although Sudbury created a Master Plan, as outlined above, this plan for redevelopment needs new projects and perspectives to rejuvenate the downtown area, such as the adaptive reuse of historic and/or industrial buildings. Due to this, as well as the lack of revision to meet the changing conditions and feasibility of some of the goals set, little of the planned development has come to fruition. In total only five of the 52 goals have been met since the completion of this document in 2012, namely:

- Beer Store
- Laurentian School of Architecture
- N'Swakamok Friendship Centre
- Riverside Pedestrian Tunnel Upgrade
- Durham Street Upgrade[20]

These upgrades and additions (particularly the Beer Store) do not sufficiently address the major needs of the city. The Master Plan fails to take into consideration areas beyond the downtown core.

Yet utilizing these spaces can be beneficial, particularly with regards to safeguarding local history and creating safe and vibrant public spaces that are accessible to diverse users. The plan desires for Sudbury to be a "gateway" by branching out into other areas but does not outline how this is to be achieved. Downtown Sudbury needs to foster a better connection to the communities living and working in and around it because as the Master Plan states, the downtown is the heart of a city. Pushing this metaphor further, the problem is that without strong veins and arteries (which are the communities just beyond the downtown core) circulating vital fluid to the heart, the downtown will slowly deteriorate and die.

In order to branch out and extend the mandate to revitalize the city in an inclusive way, there needs to be a clearer focus on the best places to start. The recommendation driving this thesis project is that these initiatives should extend beyond the western edge of the train tracks. Through adding the Northern Brewery precinct to this plan as a center point for Sudbury, a more vital connection to downtown will be created, which will resolve several of the issues that the previous plan missed, particularly affordable housing. By enlarging the vision and mandate in this way, Sudbury can better reach its aspiration to be a safe and dynamic destination for people and businesses. Working with existing sites, focusing on the needs of the community, and creating spaces that address the socioeconomic and environmental issues that Sudbury is facing are crucial to expanding the city and stimulating population and economic growth. In sum, the City of Greater Sudbury has stated its intention to focus on re-greening by: 1) creating public green spaces, such as the Elgin Greenway; and 2) making streets more walkable by planting trees.[21] Yet this is not enough. To create a greener Sudbury, attention needs to be paid to the regeneration of defunct buildings as part of an agenda for sociocultural, economic, and environmental sustainability.

Endnotes

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13. Ibid, x.

14. Ibid, 20 & 39.

15. Ibid, 21 & 34.

16. City of Greater Sudbury, “Downtown Sudbury Going Downtown Growing Downtown,” 7-8.

17. Ibid, 2.

18. Ibid, 14.

19. Ibid, 14-15.

20. Ibid, 12.

21. Ibid, 7.

02
SITE ANALYSIS

The former Northern Brewery complex sits on an island site between a residential zone to the west and a commercial and industrial zone on the other three sides. Understanding the context, current status and history of the Northern Brewery is key to developing the reasoning behind the protection and adaptation that will occur on the site in the design process. This context includes the plan for the revitalization of downtown Sudbury and the issue of affordable housing that must be addressed. Similarly, mapping the area's programmes, types of zoning, green spaces, and proximities to the surrounding buildings, assists setting a new agenda for the revitalization of the Northern Brewery site and the surrounding area. The following site analysis demonstrates that the most appropriate programme for the site must address the problems faced by residents in the area.

History of the Northern Brewery

The large, industrial building located at 185 Lorne Street, in Sudbury, Ontario, Canada, provides an opportunity to critically explore how adaptive reuse can revitalize industrial areas and bring back life to the surrounding community. What was originally known as Northern Brewery Limited has had a large undertaking since the construction of the first of several connected buildings in 1907. Doran, Mackey, and Fee were the original owners of the brewery.[1] Together these men expanded their company and brought the processing of beer to several cities throughout northern Ontario. The company's immediate success resulted in the establishment of new breweries in other northern cities, such as Sault Ste. Marie, Kakebeka Falls, North Bay, Port Arthur and Timmins.[2] During this time there were major changes to the original structure of the Sudbury brewery, including several expansions to the original facilities in 1911, 1913, 1937 and 1967. These addition also entailed an increase in part of the complex's height, making the building much larger and giving it a castle like appearance.[3]

Over the years, Doran took sole ownership of the company and changed the named to Doran's Northern Brewery. Although there was a large growth within the company, Doran took a big economic hit in 1962 and the company had to close its breweries in Kakebeka Falls and Port Arthur.[4] This decline in the industry resulted in the company being purchased by Canadian Breweries Limited, but still operated under the name of Doran's Northern Ontario Breweries Limited in an attempt to maintain its identity.[5] The ownership of Canadian Brewery did not last long as the employees bought back the company in 1977 and became the first employee-owned brewing company in North America. Although the employees looked to revitalize the local brewery industry, it continued to decline and was purchased by an investment group in 2004 led by William R. Sharpe.[6]

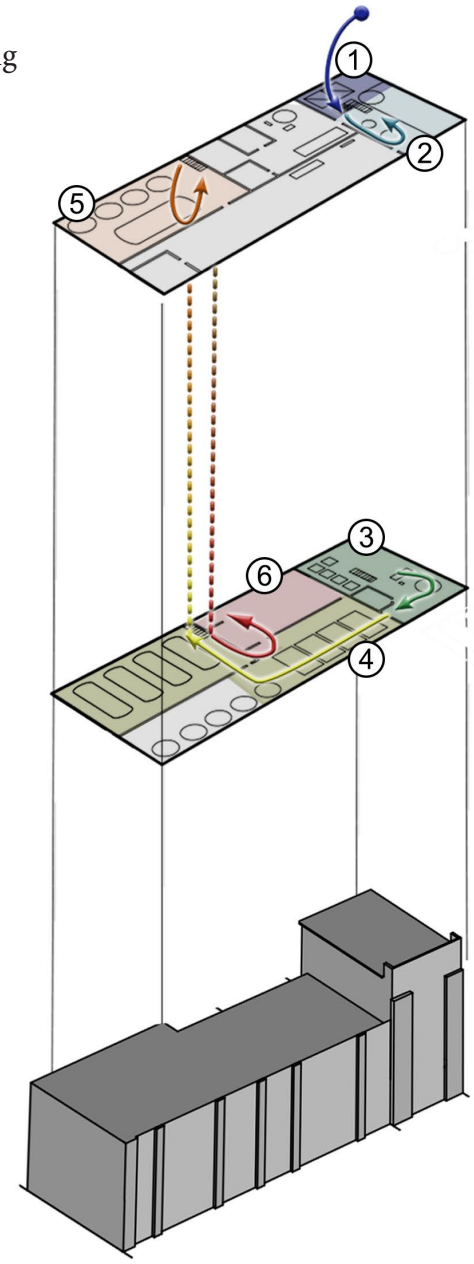
After ownership changed the company undertook a major re-branding effort, retiring many of its old products in favour of more modern brews and brand identities. However, this was to no avail, as reflected by the fact that in 2006, the company was $7 million in debt and was forced to end production at the Sudbury facility.[7] Until this point, the Brewery continued to produce bottled beer, cans and draught.[8] The highs and lows of the company are reflected in the piecemeal architectural additions to the building, additions such as a smoke stack, and the deterioration of the exterior. The changes in ownership and production also impacted the internal organization of the production process, depending on what was being produced at the time.

The company's facility in Sudbury was acquired in 2010 by Sookram Bus Lines with the aim of turning it into a depot for his tour bus company, but this too did not prove to be a successful business venture.[9] Today the building is currently owned by developer Greg Oldenburg who is pursuing his dream of changing the building into an iconic upscale condo development. With little assistance or support for this design from the city of Sudbury, the building remains unused and continues to decay within the urban landscape. While not deemed a heritage site, the building is considered a historic building according to the Young Canada Works Project.[10]

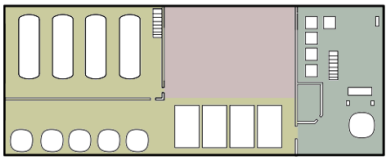
Northern Brewery - 1907

Figure 17:
Diagrams of the spatial organization of the beer making process at the Northern Brewery in 1907.

Malt
Mashing
Lautering
Hopping
Fermentation
Packaging



First Floor



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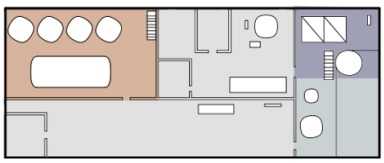


Northern Brewery - 1937

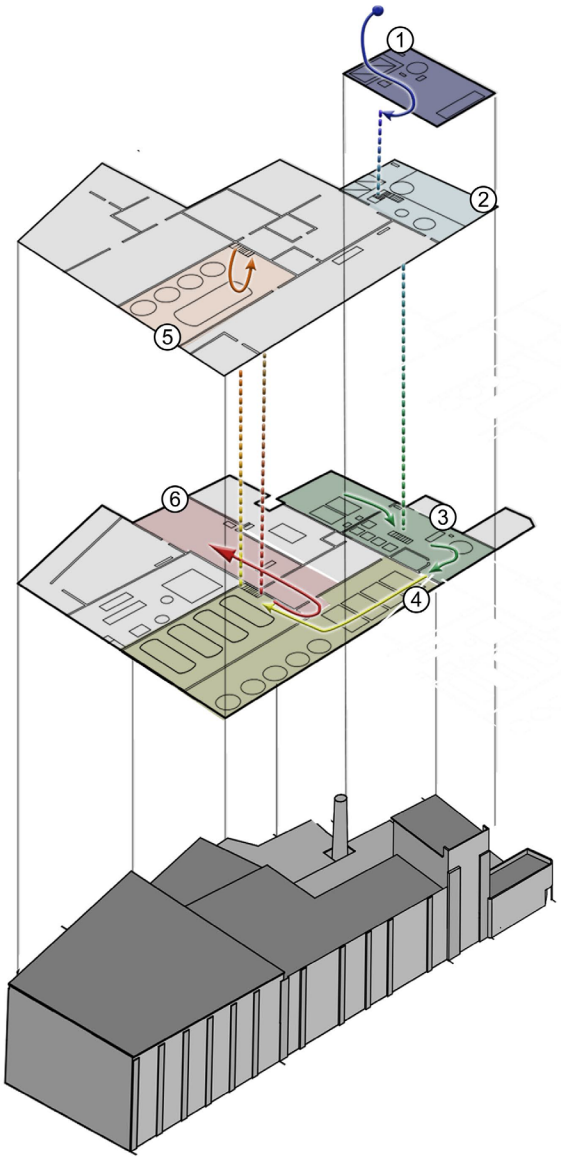
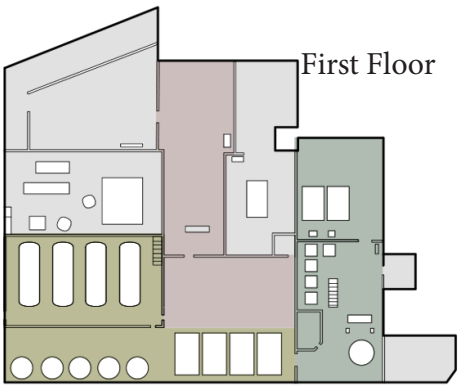


Figure 18: Diagrams of the spatial organization of the beer making process at the Northern Brewery in 1937.



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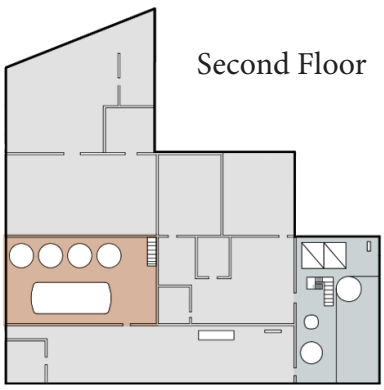

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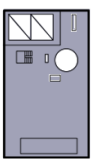
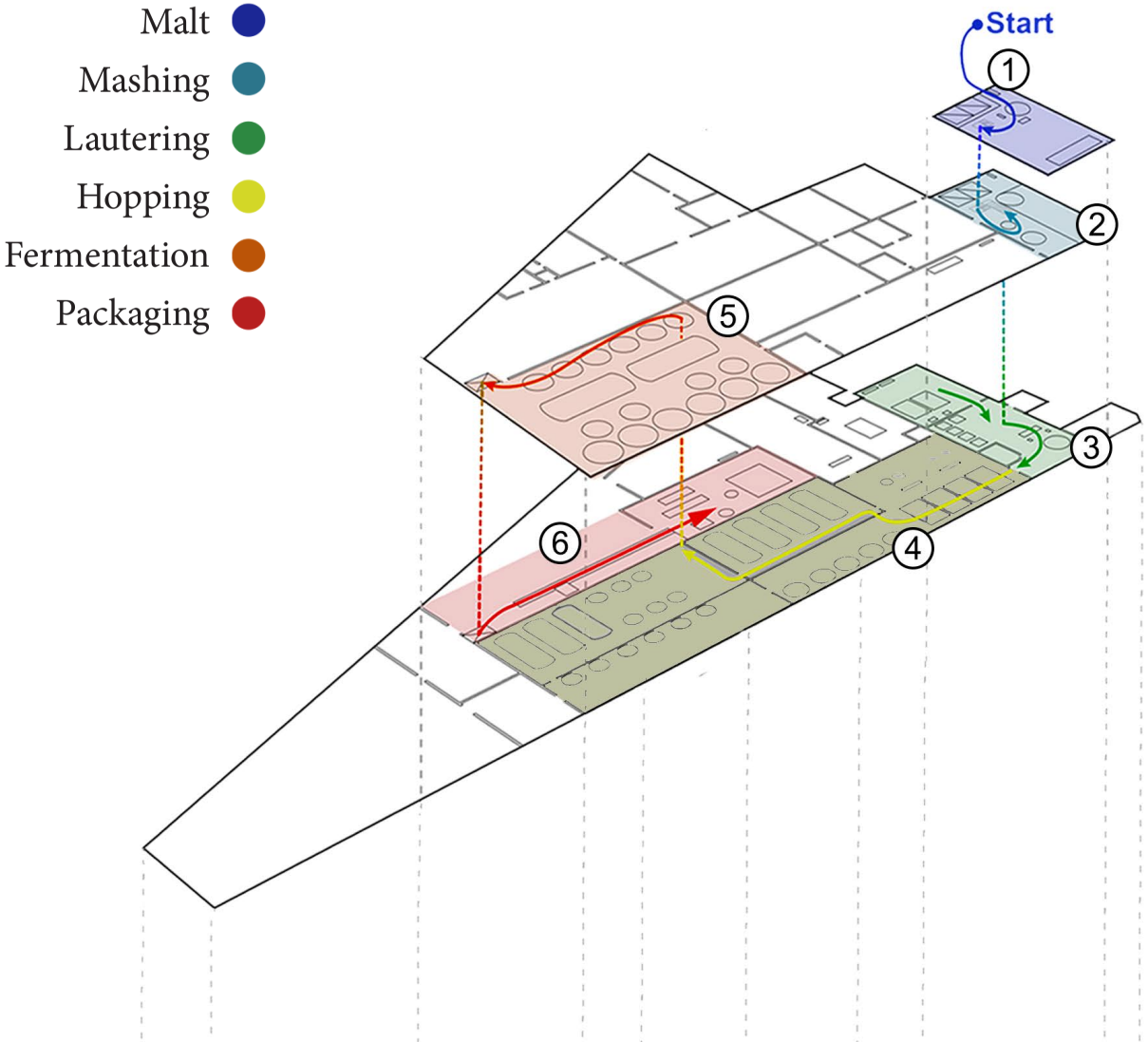
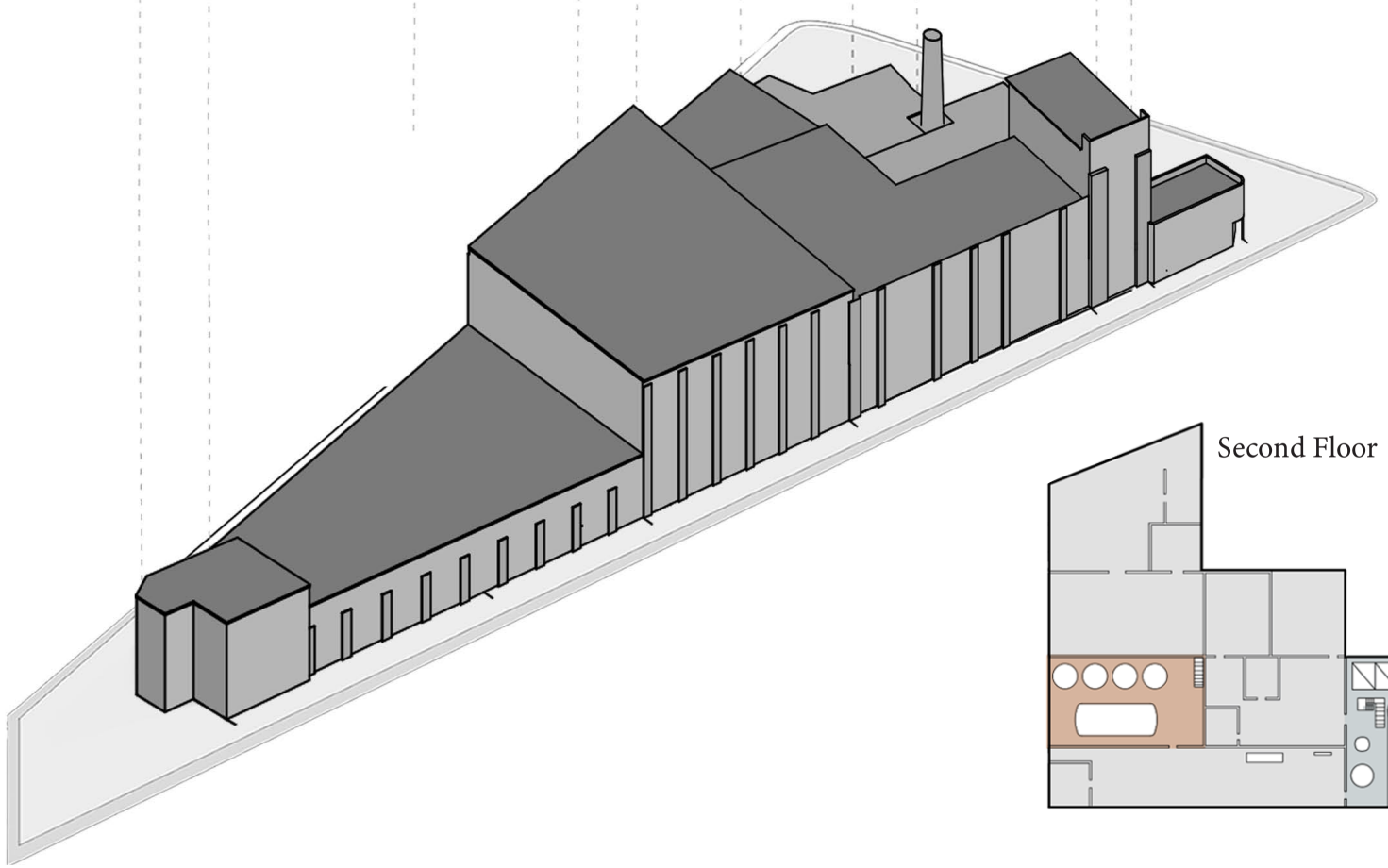
Third Floor



Northern Brewery - 1967

Figure 19:
Diagrams of the spatial organization of the beer making process at the Northern Brewery in 1967.





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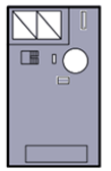
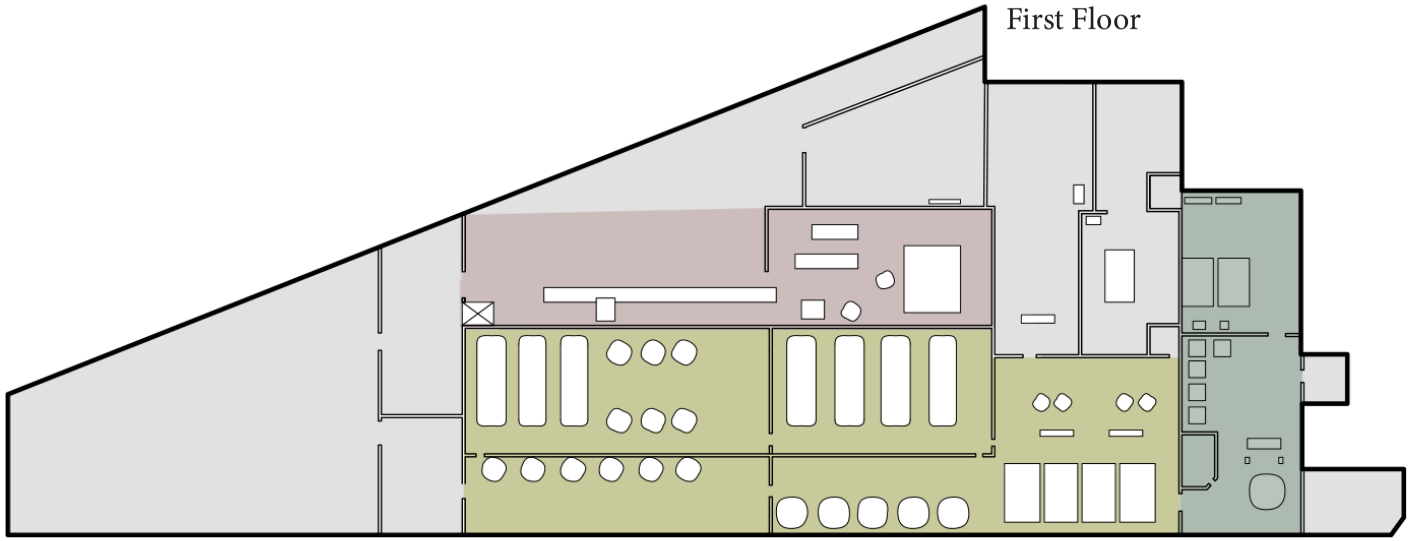

Third
Floor


First Floor

Sudbury's Public Programmes

This map highlights the existing amenities and public programmes that surround the Northern Brewery. This information sheds light on what types of programmes are still needed to support the residences of the future mixed-income housing on this site and support the future growth of this area, such as daycare facilities, cafés, restaurants, commercial spaces, a community center, and health center.

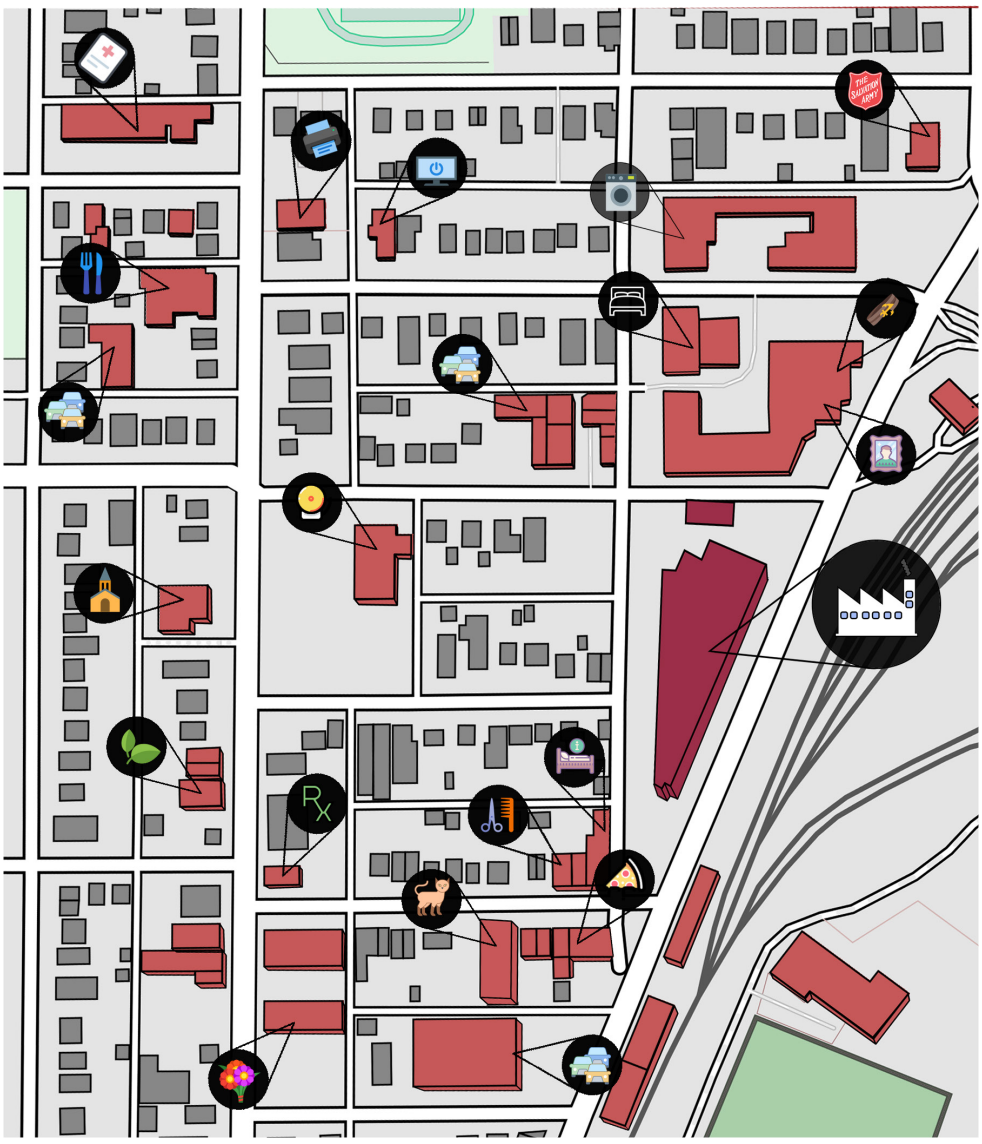


Figure 20:
Map of public programmes surrounding the Northern Brewery site.

City Zoning

This map highlights the variety and location of residential units (in grey), as well as the commercial, industrial and institutional buildings in the vicinity of the Northern Brewery site. With a large number of residential and commercial lots surrounding the area, it is relevant for the Northern Brewery to be revitalized in a way that better connects to these zones.

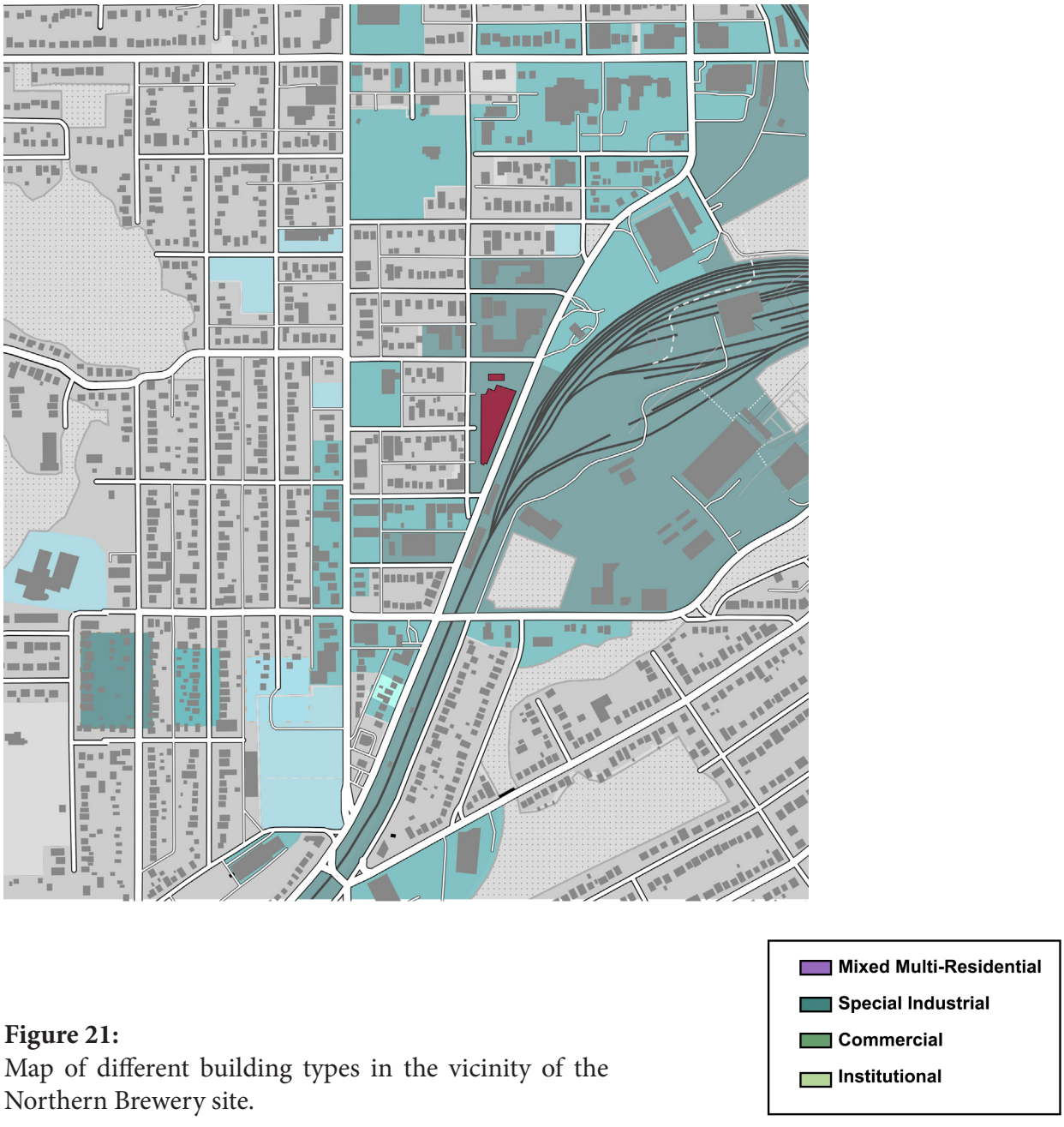


Figure 21:
Map of different building types in the vicinity of the Northern Brewery site.

Drawbacks of the Site

The site of the Northern Brewery has suffered from many issues since it went out of business. It is a neglected industrial building surrounded by many other old and unmaintained edifices. One important issue the site has had to contend with has been finances. No company or owner has created a plan that can use the existing site in such a way that generates profit, and the plans that have been generated to date, involve a significant amount of costly demolition. The facility was bought by Sookram Bus Lines in 2010 because the owner desired to use the site for new operations, but the plans were deemed not fiscally feasible. This led to the building changing hands again in 2013 when it was bought by Greg Oldenburg who desired to change the building into a condo loft development.[11] In 2016, the area was approved to be rezoned for lofts, but no work has commenced on the site.[12] Oldenburg asked for money for his plans in 2018 but was turned down. In February 2019, he was approved for a different funding plan that is much smaller in scale. However, "he won't be able to access the funding until he meets certain benchmarks, such as taking out building permits or completing aspects of the project", so again, the plan may not be sustainable financially.[13] Similarly, these financial issues are also reflected in the social profile of the area as there are clear socioeconomic challenges in the area surrounding the site. The median of household income for families is in the low income range, with a significant number of those residents spending over 30% of their income on housing. This high spending on housing indicates high rent or mortgage rates in the area that are unsustainable for residents and may induce homelessness.[14]

The physical site is very large, taking up nearly one block of space between Victoria and Alder Streets. The building is deteriorating, particularly on the exterior, which creates public safety issues and hazards to the ecosystem, while leaving the building otherwise considered an eyesore by the majority of the public. Appearing like an island fortress along the high traffic Lorne Avenue, the building creates a physical separation between the residential area to the west and the commercial/industrial zone to the east. This creates a divide between residents in different parts of downtown and better businesses and customers. This divide is furthered by the placement of the building to the west of the railway tracks, which separate the site from the rest of downtown Sudbury. This situation is aggravated by the problem of the too few accessible walking paths and well-maintained roads, which could alleviate this separation. Thus, taken as a whole, the socio-spatial divide and the building's history of financial problems result in the surrounding area and the local residents to be deemed undesirable. This heavily undermines the promotion of cultural exchange and the creation of a strong, inclusive community.

Conclusion

Although the Northern Brewery site has many issues to contend with, it does provide an opportunity for growth as it sits at the centre of the city's socio-urban divide. Probing the potential to revive this site as a place of collective connection rather than disengagement, is a central ambition of this thesis. Through the subsequent investigation of literature focused on the benefits of adaptive reuse, relevant case studies and the development of a business plan, it will be clear that the solution to the problems of the Northern Brewery lies in a strategy of adaptive reuse. Adaptive reuse will preserve what is most promising about the existing condition, such as the local history, it will enhance what can be salvaged, and will remove the existing barriers. The regeneration of the site will bring new life to the building itself as well as to the surrounding area, stimulating revitalization on cultural, ecological, socioeconomic and physical levels. Beyond the specifics of the particular building and urban conditions of this chosen site, the design and adaptation of the Northern Brewery will offer a more general demonstration about how the regeneration of old industrial sites in de-industrializing cities can have a tremendous positive impact on the overall social and urban landscape. In this way, this thesis is offered as a model for other future projects locally, nationally and internationally of this type.

Endnotes

1. "History," *Northern Breweries*, last modified 2017, http://northern-breweries.com/history/.

2. "Northern Breweries Ltd," *Company Listing*, last modified 2006, http://www.companylisting.ca/Northern_Breweries_Ltd/default.aspx.

3. Michael Kelly et al., "Northern Breweries Ltd.," *Inventory and Guide to Historic Buildings In Sudbury*, Vol. 8007 (1978).

4. Ibid.

5. Jorge Herrara,"Northern Breweries: Revisited 2010," *Cue to Images*, last modified 2010, http://www.blurb.ca/b/1840308-northern-breweries-revisited-2010.

6. Ibid.

7. "Northern Breweries Ltd," *Company Listing*.

8. Jorge Herrara, "Northern Breweries: Revisited 2010."

9. Michael Kelly et al., "Northern Breweries Ltd."

10. C. Mulligan, "Old Sudbury Brewery Gets New Life," *Sudbury Star,* last modified June 19, 2014, https://www.thesudburystar.com/2014/06/19/old-sudbury-brewery-gets-new-life/wcm/c250b82b-7721-e9e0-fd34-2e72208c6fd1.

11. Darren MacDonald, "Brewer Lofts Condo Plan Takes Another Step Forward," *Sudbury.com*, last modified November 25, 2016, https://www.sudbury.com/local-news/brew-lofts-condo-plan-take-another-step-forward-474211.

12. Darren MacDonald, "Sudbury Council OKs $4.1M for Brewery Condo Plan," *Northern Ontario Business,* last modified February 25, 2019, https://www.northernontariobusiness.com/regional-news/sudbury/council-makes-suprise-about-face-oks-41m-for-once-dead-lorne-condo-plan-1256459.

13. Ibid.

14. "A Social Profile of Greater Sudbury," *Social Planning Council of Sudbury*, last modified 2014, http://spcsudbury.ca/wp-content/uploads/2014/10/Social-Profile-of-Greater-Sudbury-2009-SPCS.pdf, 111.

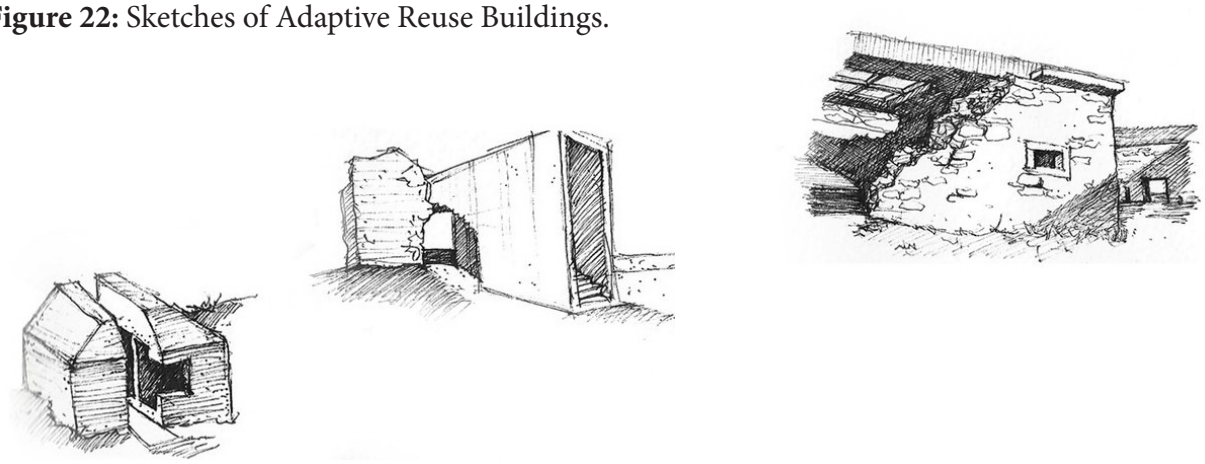
03
LITERATURE REVIEW

This literature review demonstrates the background knowledge, theories and vocabulary that provide the supporting evidence for the main points of this thesis and provides an analysis of the methodologies and approaches advanced by other researchers. Overall, this section is also meant to give a basic understanding of the technical terms related to adaptive reuse, and provide further insight into where future research is directed. This thesis analyzes how derelict sections of de-industrializing cities can be regenerated through adaptive reuse and cultivate reconnection to the community. Supporting this claim, the work of Özen and Ahmet Eyüce, Liliane Wong, Martina Baum and Kees Christiaanse in particular, argue that adaptive reuse is more beneficial than demolishing buildings and starting from scratch.

Adaptive Reuse and its Benefits

Özen and Ahmet Eyüce explain that adaptive reuse is the process of converting an existing building to accommodate new functional requirements, and is meant to prevent a building from otherwise becoming obsolete.[1] When approaching design through adaptive reuse there are limitations caused by the existing building. However, these limitations should not be seen as negative, but rather as a positive as they are related to the historical importance of the space. As the authors suggest in reference to other cases, the revitalization of the historic Northern Breweries building as envisioned in this thesis project, will allow inhabitants of Sudbury to experience the past of their own legacy, through collective memory as time is reflected in the architecture. Similarly, through positively renewing this one building, it can act as a catalyst that inspires transformation of other sites in the area, while also making history more relevant and easier to engage with.[2] These authors as well as others describe adaptive reuse as the procedure of changing a building to be usable in the present while still giving importance to its history. However, there is not one single adaptive reuse method. Rather, strategies of adaptive reuse vary in which parts and how much of the existing building are kept. The position of authors Özen and Ahmet Eyüce influences the way in which adaptive reuse will be approached in this thesis, as they highlight the importance of considering the spatial configuration of the existing condition, its tectonic and building aspects, and the context and culture within which redevelopment will take place.[3] These factors were considered in the design, but also influenced the choice of programme in the proposed adaptive reuse of the Northern Brewery, particularly with respect to the culture of the community that surrounds the space.

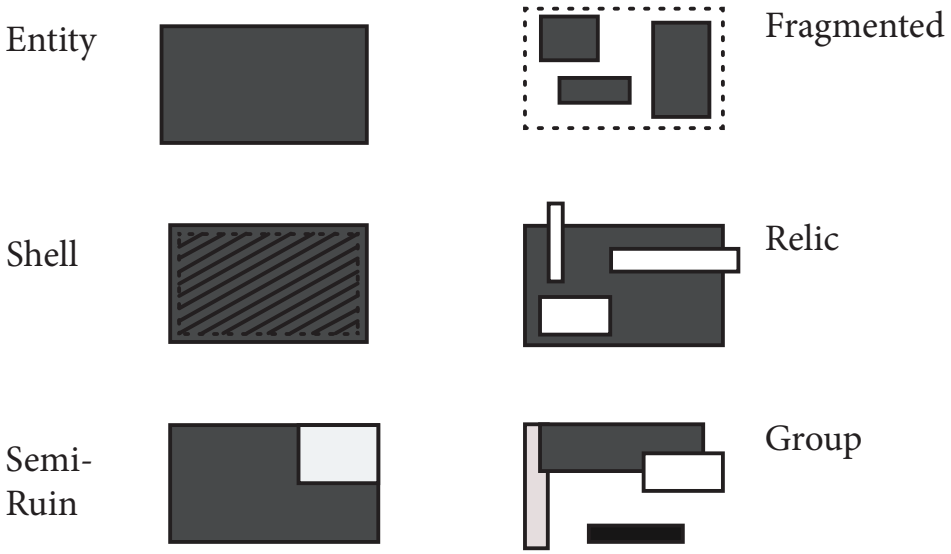
Figure 22: Sketches of Adaptive Reuse Buildings.



Lillian Wong, author of *Adaptive Reuse: Extending the Lives of Buildings*, explores the history of adaptive reuse and examines theories behind this approach to architectural practice. Wong begins with the term "host", which is defined as the original building that no longer serves a purpose today.[4] From here Wong describes six host structure types, which reflect the general adaptive reuse approaches to modifying the existing building, namely: "entity," "shell", "semi-ruin," "fragmented," "relic" and "group." These are defined as follows:

1. **Entity:** It is the original structure in its current condition also known as the host structure.
2. **Shell:** Only the interior of a building is transformed while ensuring the exterior is either preserved or unaltered.[5]
3. **Semi-ruin:** The structure is not entirely intact and is missing infrastructure allowing not only for interior insertions but also additions.[6]
4. **Fragmented:** An addition or additions to the existing building while acknowledging the history of the site and respectfully preserving parts of the host structure.[7]
5. **Relic:** The pure preservation and conservation of a building through ensuring the previous style of the building is kept in order to create a connection to the past.[8]
6. **Group:** The process of preserving several surrounding host buildings, yet done in such a way that can incorporate any of the previous adaptive reuse strategies.[9]

Figure 23: Host Structure Types.

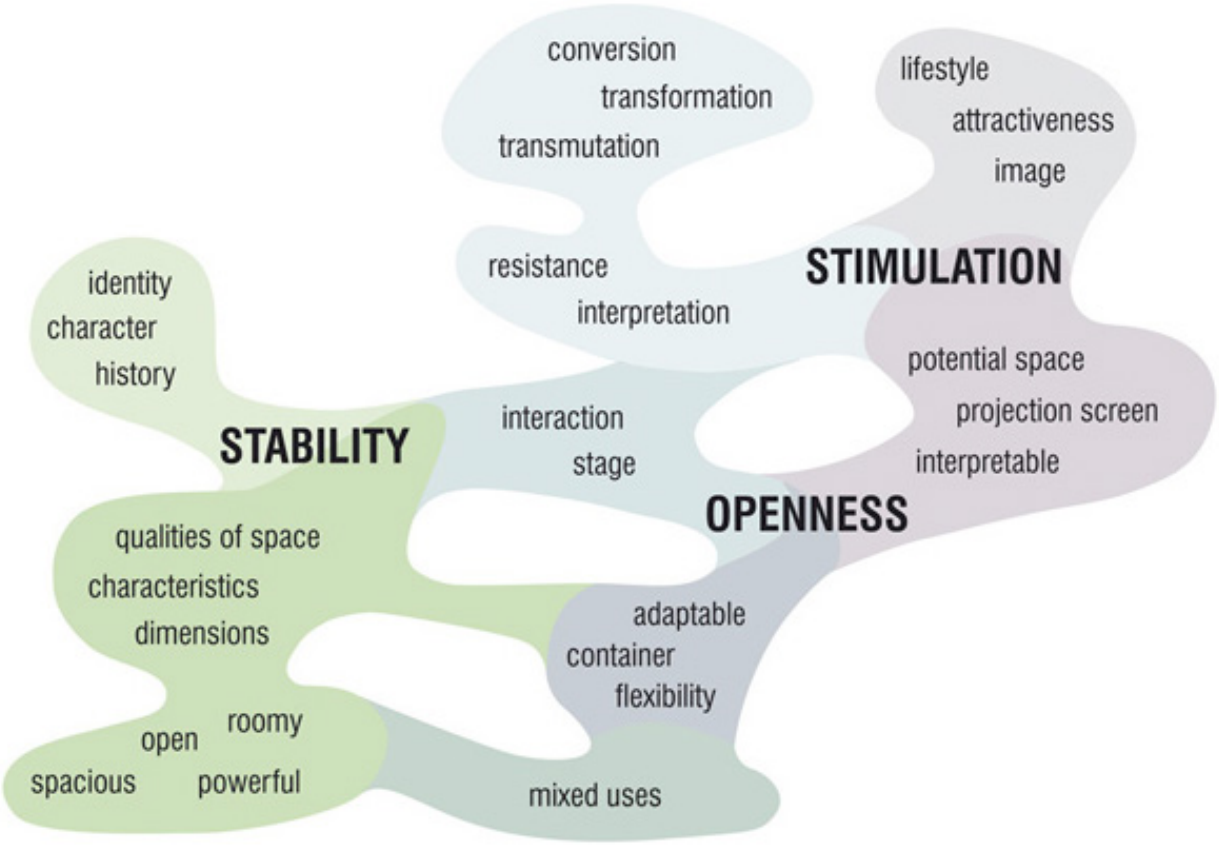


Wong argues that although there are multiple approaches to adaptive reuse, taken together, it is a design practice in its own right. Wong's analysis of adaptive reuse is presented differently with each building that she studies, and although she classifies adaptive reuse into different categories, each outcome is never the same. In giving significance to the existing built fabric, adaptive reuse encourages connections between a building and the surrounding community. This highlights the reasoning as to why adaptive reuse was chosen in the urban context of this thesis, as projects of adaptive reuse build connections to the context, history, and origin of a place, which is often lacking from the landscape of cities today. At the same time, these projects are also future-oriented as they reflect the desires of the community in their new programmes and new function.[10]

Baum and Christiaanse acknowledge that not every historic building will be granted heritage or museum status ensuring its preservation, but argue for the need for old buildings to continue to live.[11] An effective way to do this is through adaptive reuse, which for the authors is the process of converting a historic structure in a way that preserves the shared memory and story of a location while allowing for new patterns of usage and types of buildings to be created. This allows for original buildings, if converted appropriately, to remain an active part of the urban realm. Adaptive reuse allows the users and community to be interlaced with the movement through time and space, while capturing and releasing a great amount of energy and creativity.[12] Similarly, adaptive reuse is crucial as it allows for social capital to be preserved via the protection of the civic identity of belonging created through a connection of common history.[13] The authors also argue for the importance of adaptive reuse as it leads to sustainable development, given that adaptive reuse is about "working with what is already there" as a form of recycling old materials already in existence and creating a new space that addresses the future needs of the communities that they reside in.[14] Relevant to this thesis, is the idea that part of the value of adaptive reuse owes to its social benefits. These projects are interconnected with the community in a way that creates stability and openness while stimulating growth, creation, regeneration and life, as the Northern Brewery project will do for Sudbury. De-industrializing cities, such as Sudbury, need this type of preservation and creation, which is sustainable for the economy, the environment, and the community.

The authors highlight that there is an interconnectivity between the stableness, openness and stimulation gained from a project of this kind. This is similar to the interconnectivity between the users of adaptive reuse, the history of the place and the community, which is reflected in this image.

Figure 24: Adaptive Reuse in an Urban Context.



Restoration as a Precursor of Adaptive Reuse

Figure 25: Sketch of a Concert Hall.
A sketch of a concert hall of brick and cast iron by Viollet-le-Duc.

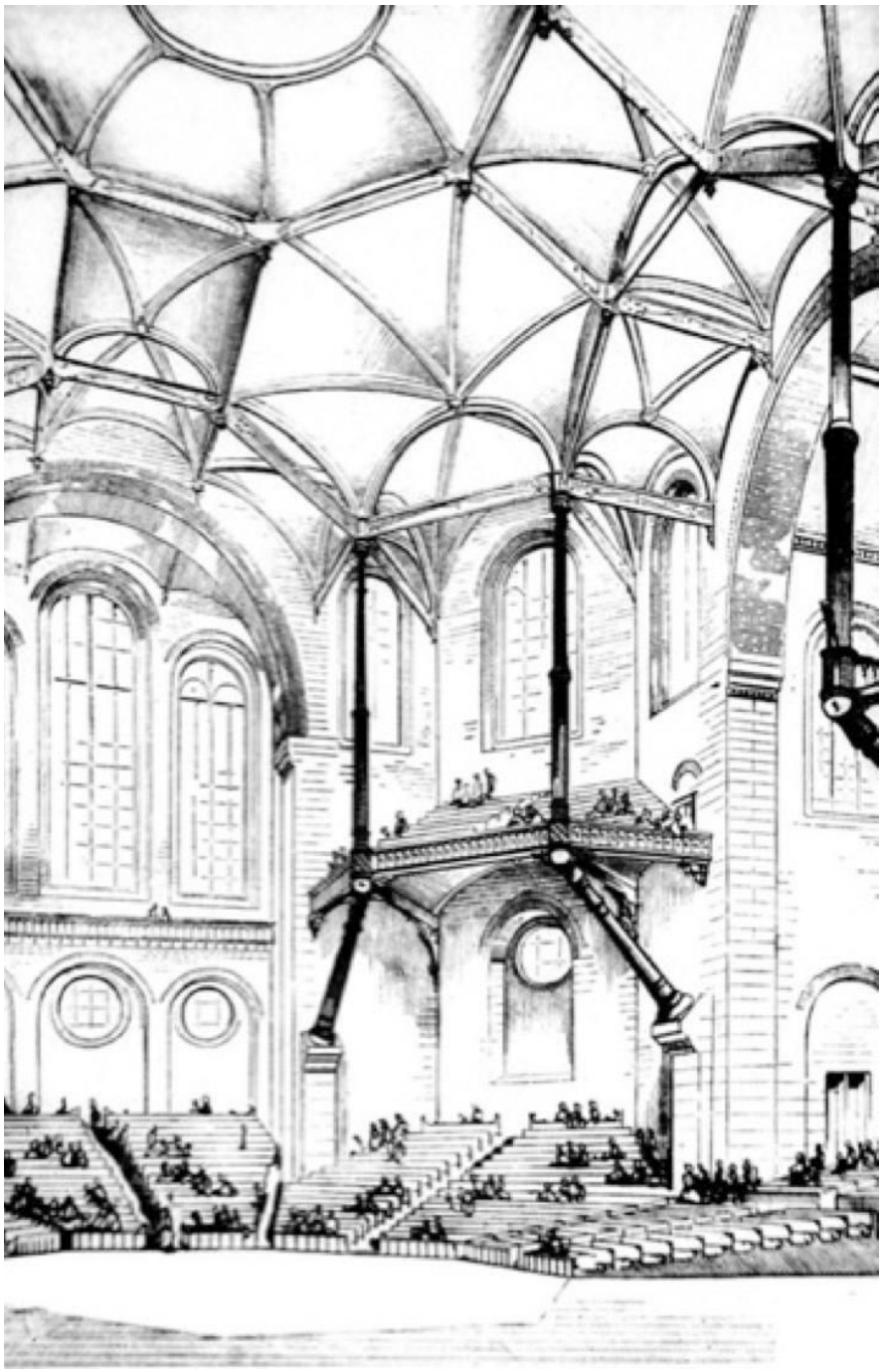


Figure 26:
Notre-Dame Cathedral, Paris.

South exterior and transept with Seine River in foreground.

Writing in the nineteenth century, French architect and theorist Eugène Emmanuel Viollet-le-Duc argued in "On Restoration", that there was value to the restoration of buildings, which at the time, was a novel concept. He defined restoring a building as not an act of repair or rebuilding, but as an act of complete re-instating that allows the building to exist in a way that it could not have at any other point in time. While the terminology came later, this process is more similar to techniques of adaptive reuse than purely restoring an original structure.[15] Restoration is a task that requires the architect to be truthful to the original building, ensuring through research and understanding, that there is no departure from the pretext and context of the original building. Viollet-le-Duc argues that restoration is important as buildings are relics of the intelligence of the past and thus should be treated as heirlooms that are to be passed down. Experiencing historical buildings assists humanity in the discovery of our own pasts and how to learn from these pasts, such as how to avoid past mistakes and create solutions for the future.[16] Viollet-le-Duc expresses that having history around shows a process of problem solving that is important for people to live their lives.[17] This process of restoration is a form of preservation and is important today, particularly to this thesis. According to architect Anja Nevanlinna, restoration highlights the social and cultural intentions of expression by protecting the cultural context of a building, which is seen in the original structure or most authentic form of a building, and it keeps memories alive that link the past with the future.[18] This thesis probes how preserving the cultural context of the building can be heightened by taking the historical aspects and mixing them with modern ones in an authentic way informed by research, in order to reach the needs of people of today and create connections within communities.

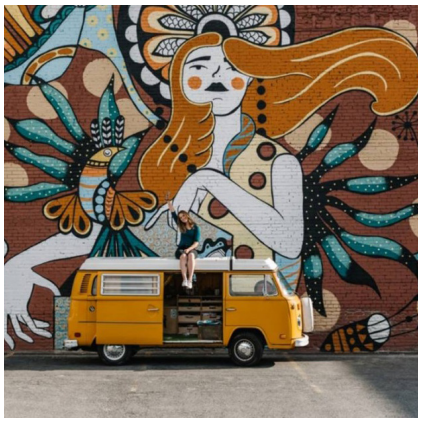
History and Community

Michael Eula, in "The Notion of History and its Importance for a Community," states that history is the use of one's reason to comprehend the world around them and to in some way have an influence upon it.[19] Thus, the notion of history and community must be connected as one theoretical framework that reflects respect for the traditions of the past by selectively preserving historic forms. This is necessary as history is relevant to the individual, determining and influencing the social and cultural factors of society, including communities. For instance, local history can be explained based on the city and the connection to the community. Through currently living in the same area and in the buildings where historical events occurred can be a stronger connection to history and one's surroundings. Therefore, local history will always have a connection between the community and the history of the place, which benefits the people of the area. Furthermore, Eula reflects and connects to human society in architecture, such as how communities interact, grow, and communicate within a city. Eula's main reasoning for the importance of historicism is that history allows the community to feel more at ease with one's self due to the connection to the past. The value of connection to the past through physical attributes like photographs, historical objects, and buildings is that it can relate to a person's self-identity as one's self-image is always rooted in and influenced by a community's heritage.[20] Communal heritage is lacking in several urban city centers, such as downtown Sudbury which desires to become a place for everyone. Highlighting this common link between people may be the solution to problems, such as negative interactions between people, as there will be a sense of camaraderie or belonging.

Eula states that a physical representation of the past is the easiest way for an individual to be able to connect to the history of the place and give relevance to the surrounding area. In the case of Sudbury, one of its more visual connections to the community and the past is the public murals that are a frequent sight throughout the downtown core. The following figures bring together thumbnails of the artistic beautification of the city and represent the need to revitalize the downtown core while still referencing many issues of Sudbury's past. The artwork has even managed to connect to the Northern Brewery, as seen on the next page, calling out for a drastic change while maintaining the essence of the area.

Figure 27: "This Too Will Change" mural (2015) on the west elevation of the Northern Brewery.


HEART OF GOLD

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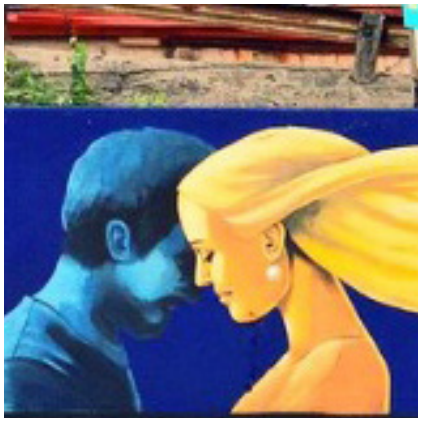
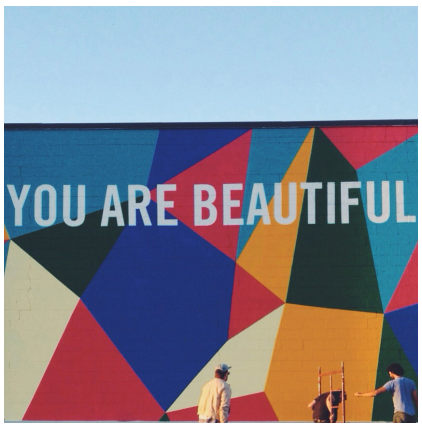



HAD ME AT HELLO


YOU ARE BEAUTIFUL

Left Images

Figure 28: Ben Johnston, “Heart of Gold” mural.

Figure 29: Alexandra Berens-Firth, “Vous Etes Ici” mural (2015).

Figure 30: Bird0, “Good Wolf, Bad Wolf” mural (2018).

Figure 31: Nico Glaude, “Had Me at Hello” mural (2015).

Middle Images

Figure 32: Ola Volo, Untitled mural (2016).

Figure 33: Hobz (a.k.a. Benoit Robin), “The Blue Moose” mural detail (2016).

Figure 34: Neli Nenkova, **“**Togetherness” mural (2016).

Figure 35: We Live Up Here [artists’ collaborative], “You are Beautiful” mural (2013).

Right Images

Figure 36: Tracy Baker, “Stay Wild” mural (2016).

Figure 37: Hobz (a.k.a. Benoit Robin), “The Blue Moose” mural detail (2016).

Figure 38: DanielLE Daniel, “Dear Sudbury” mural (2015).

Figure 39: Jarus, “Under Ground” mural (2017).

Endnotes

1. Özen Eyüce and Ahmet Eyüce, "Design Education for Adaptive Reuse," *International Journal of Architectural Research: Archnet-IJAR*, Vol. 4 (July 2010): 419.

2. Ibid.

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19. Michael J Eula, "The Notion of History and Its Importance for a Community" (New York: County of Genesee, 2011) http://co.genesee.ny.us/docs/History/The_Notion_of_History_and_its_Importance_ for_a_Community.pdf, 76.

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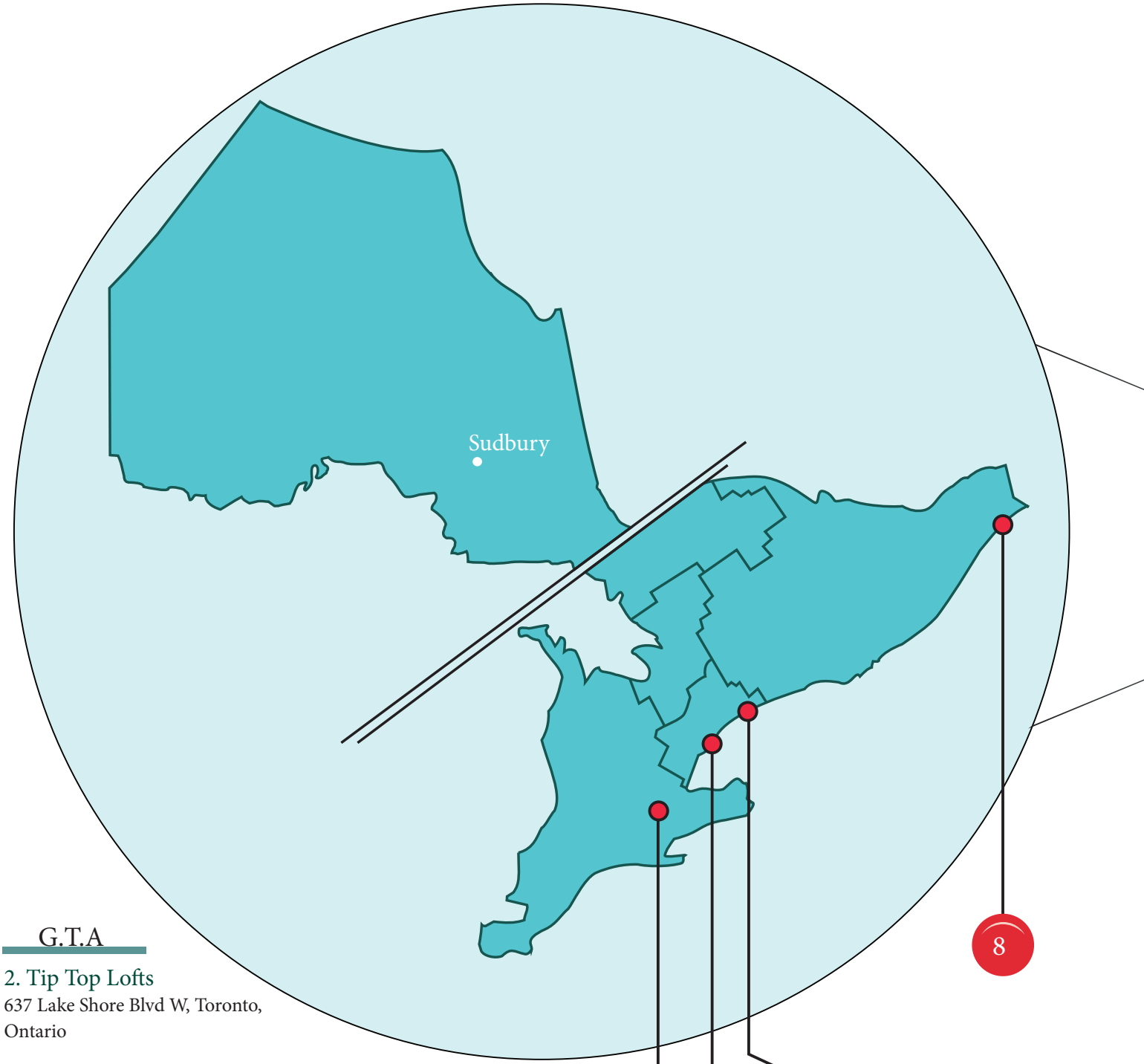
04
PRECEDENT STUDIES

The study of different cases of adaptive reuse, affordable housing and the revitalization of local cities can assist in creating a holistic understanding of the importance and benefits of the protection and regeneration of historical buildings. Similarly, these studies show that although the type of adaptive reuse may differ on a case to case basis, the benefits are interrelated and consistent. The following case studies show that although a building may lose its original function, it can be re-programmed in such a way as to enhance the cultural, social and functional components of an area by responding to issues of the area and creating solutions. Preserving historical spaces connects communities in such a way that the entire area benefits in a united manner. Through the research and analysis of these twenty-one case studies a clearer picture of adaptive reuse and social housing internationally was established as a resource for this thesis. However, the choice to focus on five projects in depth and seven in a broader manner was made because these projects align with the social benefits that this thesis hopes to highlight and reproduce.



G.T.A

2. Tip Top Lofts
637 Lake Shore Blvd W, Toronto, Ontario

3. Broadview Lofts
68 Broadview Ave, Toronto, Ontario

4. Distillery District
Mill St, Toronto, Ontario

5. Evergreen Brick Works
550 Bayview Ave, Toronto, Ontario

6. Regent Park Redevelopment
Regent Park, Toronto, Ontario

Southern Ontario

1. Brantford Redevelopment
Brantford, Ontario

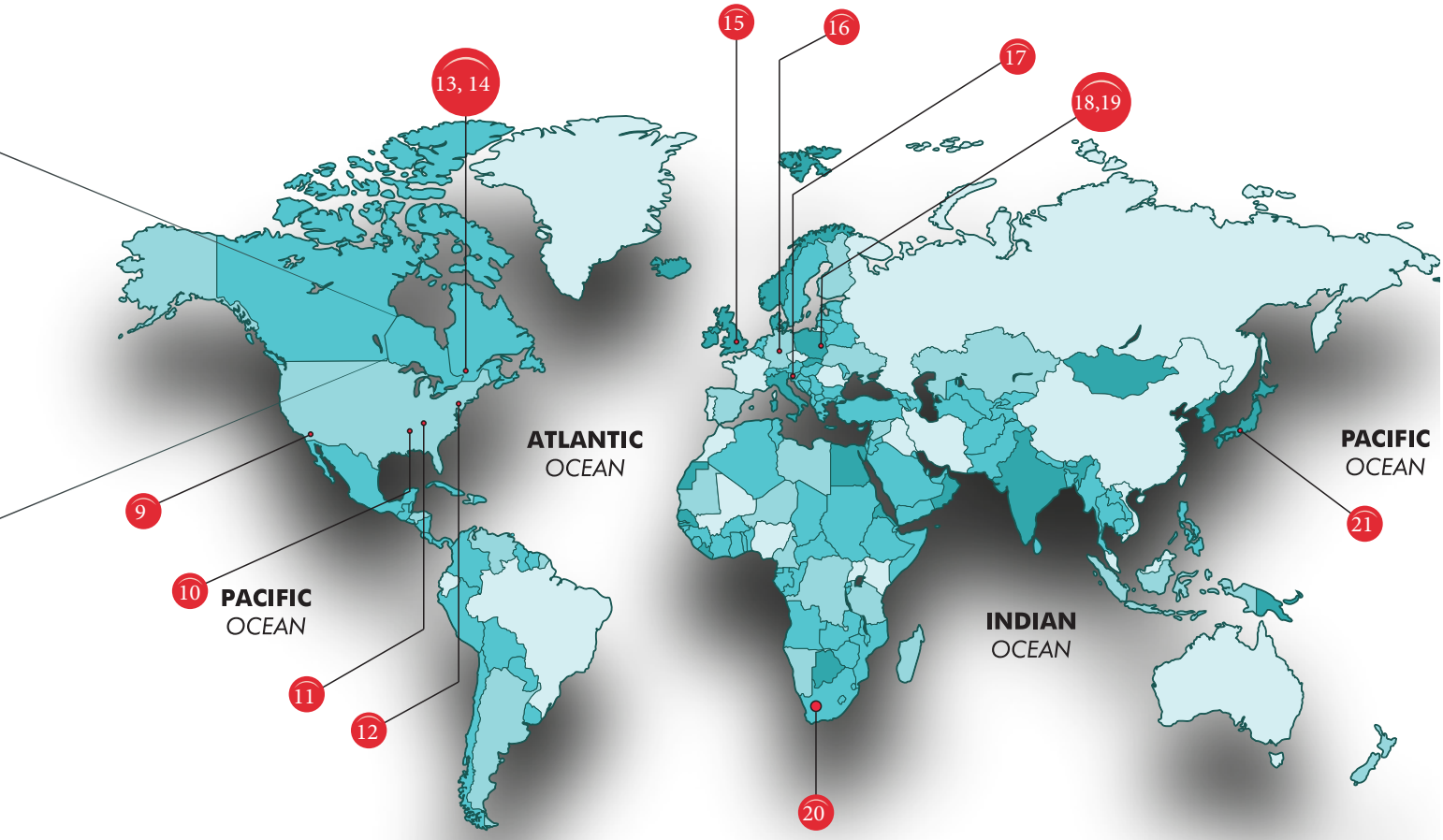
6. Oshawa Redevelopment
Oshawa, Ontario

7. Cornwall Redevelopment
Cornwall, Ontario

Adaptive Reuse Projects
City Revitalization Strategies
Social Housing Projects

Precedent Studies

Figure 40:
Map locating all precedent studies for adaptive reuse, city planning and social housing.



North America

9. Casa Familiar
San Diego/ Tijuana Border, USA

10. Boathouse Restaurant
4708 E. Old Main St, Richmond, VA, USA

11. The Green Building
732 E Market St, Louisville, KY, USA

12. Hearst Tower
300 W 57th St, New York, NY, USA

13. Benny Farm
6484 Monkland Ave, Montreal, QC, Canada

14. Allez Up Climbing Centre
1555 St-Patrick St, Montreal, QC, Canada

Europe

15. Tate Modern
Bankside, London, UK

16. The Hamburg Prototype
Hamburg, Germany

17. Izola Social Housing
6310 Izola, Slovenia

18. Antoniny Manor Intervention
Jana Ostroroga, Leszno, Poland

19. Manufaktura
58 Drewnowska, Łódź, Poland

Africa

20. Zeitz Museum of Contemporary Art
S Arm Rd, Waterfront, Cape Town, South Africa, Africa

Asia

21. Art House Project (F)
328 Inujima, Higashi Ward, Okayama, Japan

Manufaktura

Location: Łódź, Poland
Completion Dates: 2006
Architect: Sud Architectes
Original Programme: Textile Factory
Current Programme: Shopping Mall
Form of Adaptive Reuse: Preservation, Addition, Shell

Figure 41:
Aerial view of the revitalized Manufaktura complex.

The shopping entertainment center in Łódź, Poland, known as Manufaktura is a complex that originally housed textile industrial production, but lost its function over time. The new intent for the space was to incorporate the mixed adaptive reuse strategies of preservation of the shell and additions in order to allow the site to retreat back to the memory and history of the manufacturing complex while making it accessible for the future.[1] By encompassing a variety of programmes, such as shopping and entertainment, the complex is sustainable, able to be supported financially and could be redeveloped over time with the potential to embrace cultural and social stimuli drawn from the host city as needed, in order to create permanent solutions to the area's problems.[2] It is now a place to hang out and spend time in attractive surroundings which combine the city's history and identity with modernity and new qualities of life. Overall, the project was able to revitalize the area and created a connection to the past through the revitalization of this large piece of the urban fabric.

Figure 42:
Site plan of the Manufaktura complex.

Figure 43:
Photograph of one of the numerous restaurants in the Manufaktura complex.

Figure 44:
The Manufaktura complex before revitalization.

Figure 45:
The Manufaktura complex after revitalization.

Tate Modern

Location: London, England
Completion Dates: 1891 - 2000
Architect: Herzog & de Meuron
Original Programme: Power Station
Current Programme: Art Museum
Form of Adaptive Reuse: Retrofitting, Addition, Fragmented

Figure 46:
Photograph of the Tate Modern.

Located in London, England, the building housing The Tate Modern Museum was originally the Bankside Power Station, owned by the City of London Electric Lighting Company Limited, which became obsolete following technological developments.[3] Architects Herzog & de Meuron sought to revitalize the urban fabric of the building through making it function-led and emphasizing the connection to the everyday life of the community.[4] The firm focused on the significance of environmental conditions, history and the potential of adaptive reuse in order to revitalize both the building and the surrounding area. The main adaptive reuse strategy employed was retrofitting to create an interior streetscape that connects with the public from the exterior to the interior. The strategy was able to create a stronger community connection as there are new spaces to interact and gather in meaningful ways. This project shows how adaptive reuse can reveal or create new meaning and significance for a space.[5]

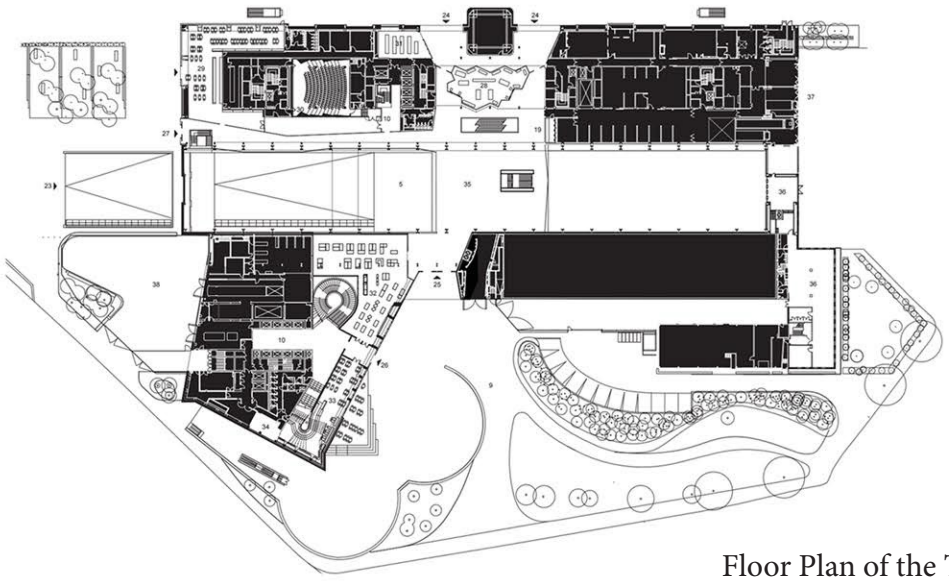


Figure 47:
Floor Plan of the Tate Modern.

Figure 48:
Photograph of the adaptive reuse of the Bankside Power Station to become the Tate Modern.

Figure 49:
Interior of the original Turbine Hall.

Figure 50:
View of the Turbine Hall of the Tate Modern.

Casa Familiar

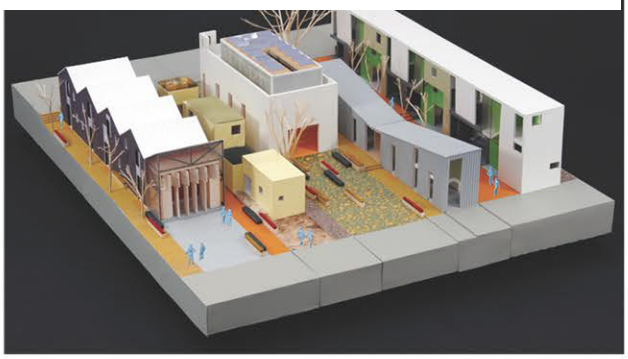
Location: Tijuana/San Diego Border
Completion Dates: 2001 - 2015 (Conceptual)
Architect: EStudio Cruz + Forman
Original Programme: Housing units
Current Programme: Revitalized Housing (not completed)
Form of Adaptive Reuse: Addition

Figure 51:
Sketch model as part of "Designing Political Process."

Estudio Teddy Cruz have a strong belief in the ability to affect existing environments through shifts in established infrastructure and policy. In 2001 the firm began their most famous project, the revitalization of the San Diego-Tijuana border. Estudio Teddy Cruz assessed the need for housing for illegal immigrants who arrived in San Diego from across the border.[6] Through analyzing the movement of materials, people, ideas and relationships Teddy Cruz created a method to evaluate the needs of the community. Overall, the team looked to create affordable housing and other structures that would stimulate the community.[7] The techniques suggested were the creation of new spaces and the incorporation of pre-existing, unused buildings into new structures, as a form of recycling, which can change the outcome of the community to decrease the transnational divide. Cruz's concept was a flexible, multi-use complex that looked to retrofit and expand an abandoned church. The adaptive reuse strategy was meant to give purpose to not only buildings that were struggling but also people. Although the project was a unique method in serving the needs and conditions of this border town, in 2015 the city did not support the project, leaving this innovative approach at the concept stage.[8]

Figure 52:
Concept collage using Donald Judd's "15 Untitled Works in Concrete."

Figure 53:
Casa Familiar model.



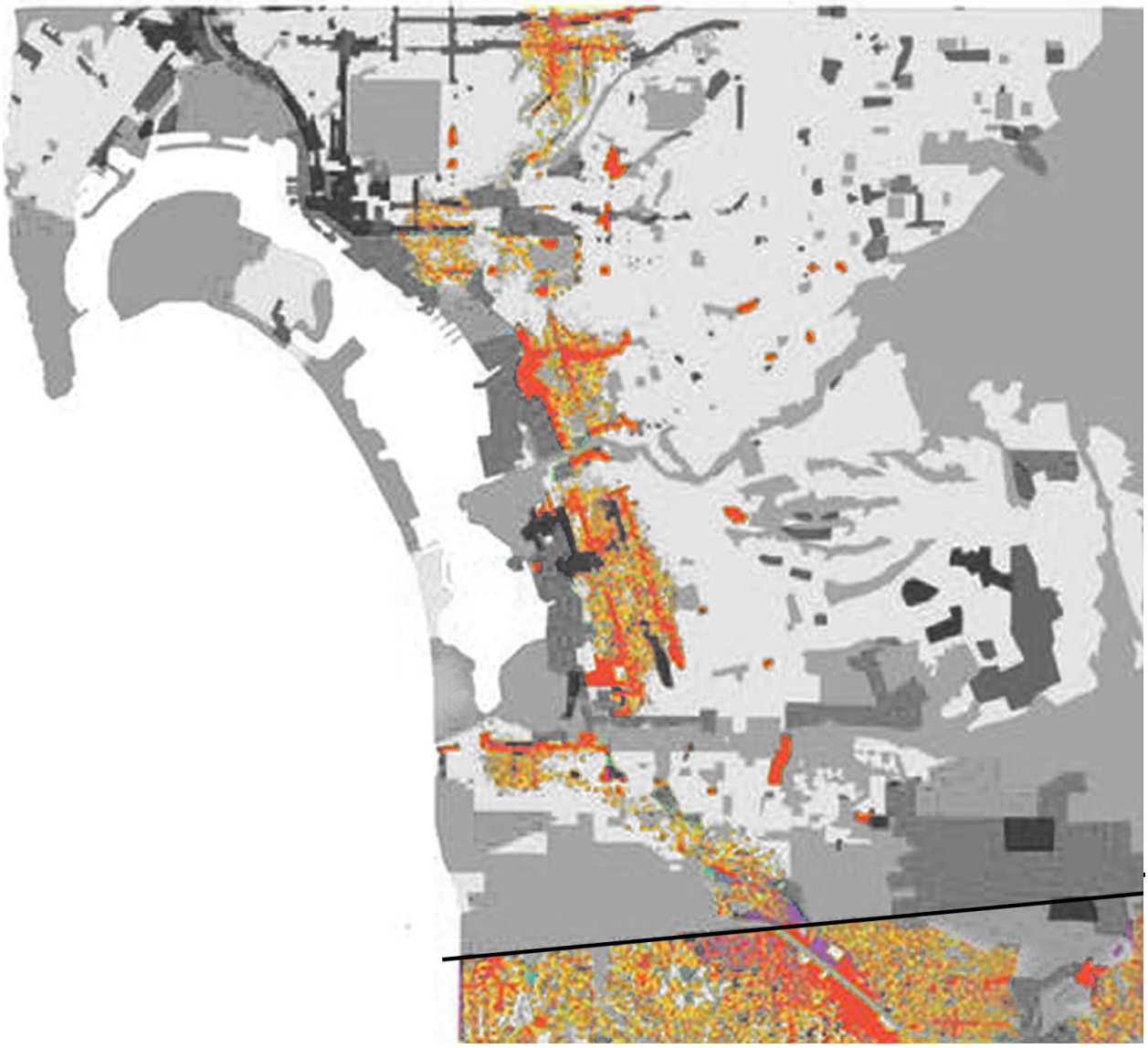
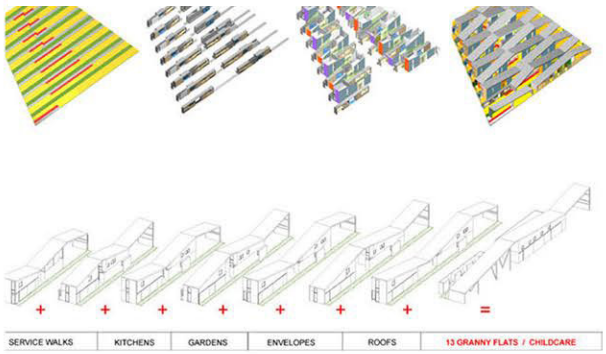


Figure 54:
Map of land use on both sides of the USA/Mexico Border.

Figure 55:
Photograph of current living conditions in San Diego.

Figure 56:
Plans and typologies included in "Living Rooms at the Border."



Cornwall Development

The Edison Building

Location: Cornwall, Ontario
Completion Dates: 2015 - Future
Architect: RMP Construction & Development Ltd.
Original Programme: Cotton Mill
Current Programme: Condominiums
Form of Adaptive Reuse: Adaptation, Addition, Fractured

Figure 57: Rendering of part of Cornwall's plans for revitalization.

Since the nineteenth century, the town of Cornwall had a strong industrial complex with flour mills, tanneries and wool mills that were steam-powered with water from the St. Lawrence River.[9] In 2006, several buildings shut down due to public concerns of factories emissions. With the recent influx of tourism, demand for jobs and better living conditions, the city designed a Master Plan to revitalize the area and assist in dealing with these issues. The city has begun and continues to add trails, recreational path networks, several new parks and a more public access point to the water. These additions are key to informing the public about Cornwall's past and creating a local identity.[10] As well, RMP Construction & Development Limited desired to enhance the local economy, further increase the population, and create a positive interaction with the waterfront through the adaptive reuse of four industrial buildings.[11] Of these buildings, the Edison building, a defunct cotton mill, was redeveloped into condos. The adaptive reuse strategy for this building was the preservation of the exterior with a two storey addition to the building. The addition is set back from the main host structure to prevent it from distracting from the historical building on which it sits.

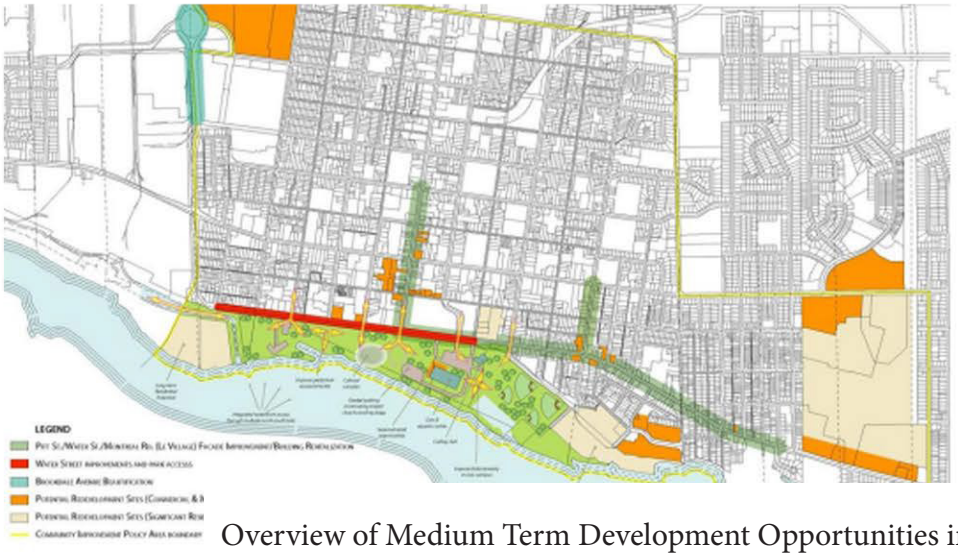


Figure 58: Overview of Medium Term Development Opportunities in Cornwall.

Figure 59:
The Edison Building at the Cotton Mill Lofts.

Figure 60:
The Edison Building Elevation.

Figure 61:
The Edison Building viewed from street level.

Regent Park Redevelopment

Location: Regent Park, Toronto, Ontario
Completion Dates: 1950 - Future
Architect: Diamond Schmitt Architects
Original Programme: Condominium
Current Programme: Mixed-Income Housing
Form of Adaptive Reuse: Adaptation, Addition, Group

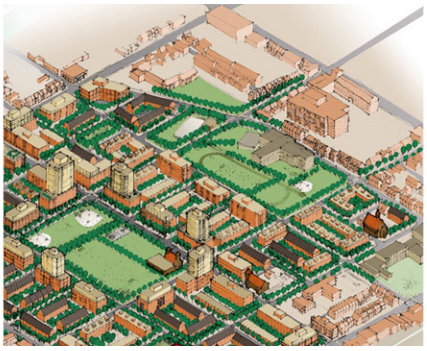


Figure 62:
Site plan of Regent Park.

Regent Park is a neighbourhood in Toronto and was originally designed in the 1940's as a social housing project. However, due to the configuration of the buildings, their lack of relationship to the surrounding area, and the poor social programmes, Regent Park became an unsafe neighbourhood known for its crime rates.[12] Over the last few years, developers have rebuilt the area as a diverse mixed-income community, to allow for a safe, open and integrated neighbourhood, while utilizing adaptive reuse methods.[13] One project of adaptive reuse was the aquatic center that retrofitted an existing outdoor pool and converted it into an indoor pool with the addition of a recreation center. The building is very open at the base with large extending windows to maintain the original feeling of being outdoors and reflect the desire to be open and inviting to everyone.[14] As well, through the gesture of mixed-income housing, a full range of community resources for the benefit of the neighbourhood as a whole became available and provided Regent Park residents with the scope of assets they need to succeed both as a community and as individuals.[15] Regent Park is currently undergoing its third stage of construction and with the introduction of the Regent Park Social Development Plan and other plans laid out by developers, Regent Park will continue to prosper due to future developments of the site.

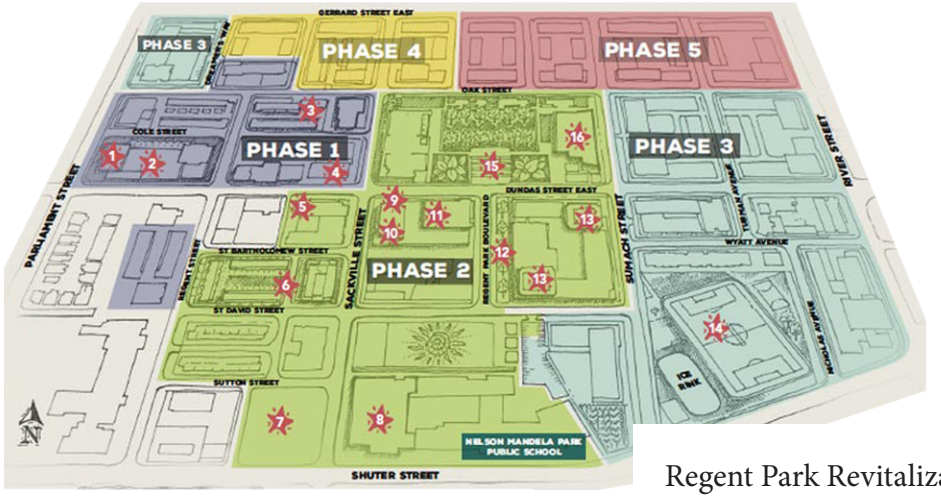


Figure 63:
Regent Park Revitalization Map.

Figure 64:
Photograph of new Regent Park Social Housing.

Figure 65:
Aerial view of the original Regent Park development.

Figure 66:
Aerial view of Regent Park.

Further Studies

Figure 67:
Aerial view of Laurier Brantford YMCA.
Brantford, Ontario

Brantford has undergone several civic improvement initiatives including re-greening, the construction of new buildings, and the refurbishing of old structures, which has led to a positive change in downtown Brantford. These projects have grown the community, economy, and social relations.[16] One main example of this is the creation of the Laurier YMCA Complex which removed the division between building and landscape and offers diverse user groups a unified, cohesive experience asserting a new identity to the block and to the city.[17]

Figure 68:
View of Oshawa streetscape and redevelopment.
Oshawa, Ontario

The re-design of the city of Oshawa was responsive to the changing community in its architecture. Oshawa expanded to include more spaces for student residences, the mixed-use redevelopment of a former industrial site to include office, retail and public space, and the expansion of transit into the downtown core.[20] This is important as it has led to the area being one of the fastest-growing economies. As a result, the area is also stronger and more diverse, such as in terms of innovations and architecture.[21]

Figure 69:
Allez UP Rock Climbing Gym.
Montreal, Quebec

Figure 70:
The Boathouse Restaurant at Rocketts Landing.
Richmond, VA, USA

Figure 71:
The Hearst Magazine Building and Tower.
New York, NY, USA

Figure 72:
Broadview Lofts.
Toronto, Ontario

The Broadview lofts project took an old warehouse and created new housing units. This project of adaptive reuse shows that communities can be built as the humans that live in the area are the main focus.[18] The design maintains much of the buildings original character, using the old brick, cage elevators and water tower. The architects embrace the context around the building to create a sustainable solution of beautiful and unique homes that combines the old and the new.[19]

Figure 73:
Benny Farm.
Montreal, Quebec

Benny Farm is located in Montréal and was a project of adaptive reuse that was created to meet the needs of the neighbourhood in terms of housing and services, while preserving the feel and history of the garden city the area was in the 1940s.[22] It conserves the original housing while inserting low- and middle-income households within, along with a recreation center and garden. The network of paths and gardens integrate the residential complex into the surrounding area in a positive way.[23]

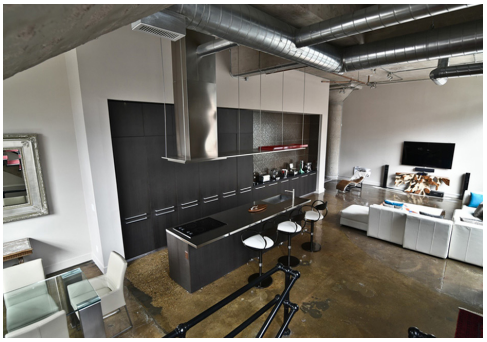


Figure 74:
Tip Top Lofts.
Toronto, Ontario

Figure 75:
The Distillery District.
Toronto, Ontario

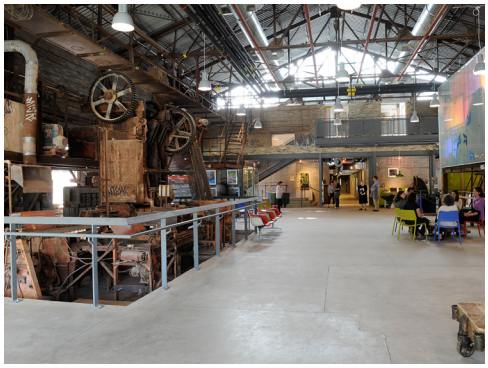


Figure 76:
Evergreen Brick works.
Toronto, Ontario

Figure 77:
Leszczynski Antoniny Manor Intervention.
Leszno, Poland

Figure 78:
The Green Building.
Louisville, KY, USA

Figure 79:
Izola Social Housing.
Izola, Slovenia

Completed in 2006, the Izola housing project is comprised of two housing blocks built for a government-run programme that provided low-cost and flexible designed housing for young households. This project demonstrates an excellent ratio between gross and saleable area.[24] In total each building has thirty apartments of differing sizes and types from studio to 2-bedroom apartments, but overall, they are small by Slovenian standards. Included in the design were textile elements that were functional and made the rooms appear larger.[25]

Figure 80:
Inujima Seirensho Art Museum.
Okayama, Japan

Figure 81:
Heatherwick Studios, Zeitz MoCCA.
Cape Town, South Africa

Figure 82:
The Hamburg Prototype.
Hamburg, Germany

In Germany, low cost and social housing was neglected for many years, however, in 2013 these needs were finally addressed with the erection of the Hamburg Prototype. This type of social housing is a mix of self-build homes, where owners develop their own floor plans, and multi-sensory housing.[26] Allowing for self-build homes helps residents save up to 30% of the construction by using their own labour while being supported by professionals.[27] Overall, this prototype shows the possibilities of creating a planned yet informal system of development.[28]

Concluding Statement

The preceding analysis of differing transformation strategies shows how adaptive reuse is about developing layers in a complex story without destroying the original text. These studies show that structures and areas are re-interpretable and subject to regeneration: buildings are dynamic but stable. By keeping an original structure, an area maintains its stable framework as the basis for its durability while still being open and allowing for new elements.[29] In each of the cases, this process and/or the creation of social housing was positive for the "physical, social, and economic wellbeing of" the areas.[30] Through looking at social housing projects, particularly Izola Social Housing and The Hamburg Prototype, it is clear that regeneration can come in many forms and support methods of adaptive reuse.

Endnotes

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23. Ibid.

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25. Ibid.

26. Alex Lifschutz, *Loose-fit Architecture: Designing Buildings for Change* (Oxford: JohnWiley & Sons, 2017), 32.

27. Ibid, 33.

28. Ibid, 37.

29. Martina Baum and Kees Christiaanse, *City as Loft: Adaptive Reuse as a Resource for Sustainable Urban Development*, 9.

30. Ibid, 78.

05
BUSINESS PLAN

The following outlines the business plan for the new hybrid programme of the Northern Brewery in Sudbury as a model to illustrate the benefits of adaptive reuse projects to the socio-urban landscape of a community while addressing the market and community's needs. The Northern Brewery is currently an unoccupied, obsolete industrial building that is approximately one kilometre from the heart of downtown Sudbury.

Summary of Opportunities

As previously mentioned, the city of Sudbury's Master Plan for the downtown core is a blueprint for the revitalization of the area. The Northern Brewery provides a great opportunity as it both fits within this model and is located within proximity to the downtown. If revitalized it can act as one of the connections to the "local neighbourhood" that the plan calls for.[1] Similarly, if the updated brewery is taken as a starting point for inspiration it could help stimulate other businesses and spaces in the area to redevelop as well, while also connecting to the history of the site. The plan is to undergo a project of adaptive reuse and protect a portion of the original brewery in the new design and programme of the building. The choice to utilize a strategy of adaptive reuse is a conscious one as it will allow users and viewers to "appreciate and understand the history of where Greater Sudbury comes from" as the Master Plan desires.[2] This building would bring the local community together as it would be a source of pride and identity as the influence of the past is expressed through the architecture allowing the "continuing story of Canada's history to be told."[3] This togetherness is also reflected in the fact that the current divisions between the historical and urban would be overcome with this type of project as it brings the two together in a harmonious relationship.[4]

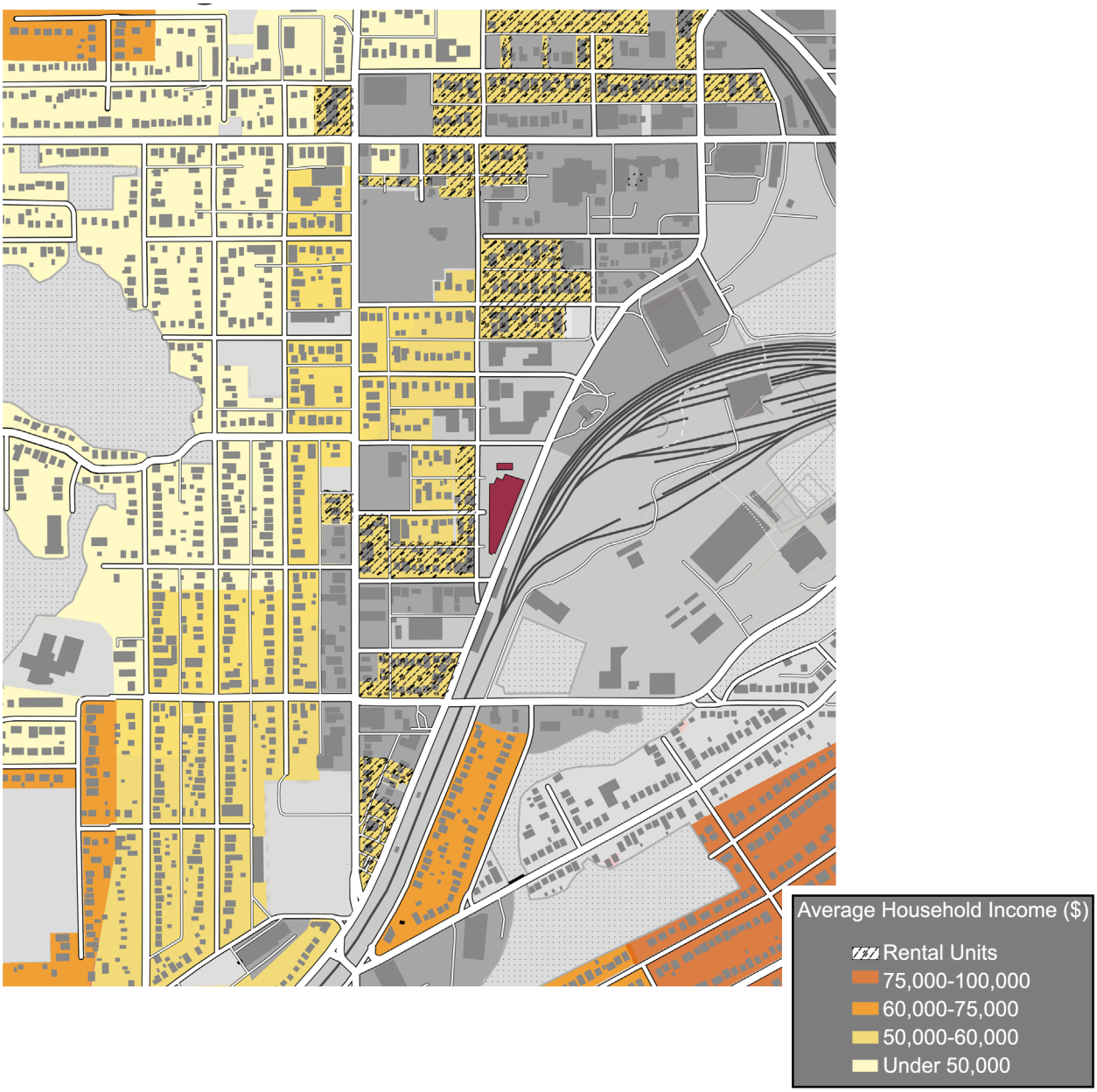
Moreover, Sudbury's Master Plan expresses the desire to bring forth the beauty and honour of Sudbury's history by making a bolder statement and highlighting the northern identity through "place making" and "preservation" which this project would accomplish.[5] Adaptive reuse is also a sustainable and "green" approach to architectural design as it utilizes what is already in place, which reduces the amount of new materials and emissions created in changing the building. This is key and again fits with Sudbury's plan to create growth in an "efficient and sustainable way."[6]

The plan for the rehabilitation of the brewery does not ignore the context of the area and the problems facing current residents, as discussed in the previous chapter "Site Analysis." The plan targets to assist low-income and middle-income families, as there are a high number of both within the downtown and surrounding area. This addresses the demand for diverse and affordable housing options. The building will be adapted to become a three-storey apartment complex with a microbrewery and gastropub on the first floor. The housing portion will be compromised of 10 affordable housing rental units and 18 rental units priced approximately at the average market price. Developing the building in this manner will allow the building to be a "centre for everyone" as Sudbury's Master Plan requires.[7]

Income Level and Rent in Sudbury

This map features the relative income levels and rent levels within the portion of Greater Sudbury that surrounds the former Northern Brewery complex. It is clear from this graphic that there are higher levels of low-income households, while there is a lower level of rent that is affordable to these households in this area.

Figure 83:
Map showing household income levels and rent levels in the vicinity of the Northern Brewery.

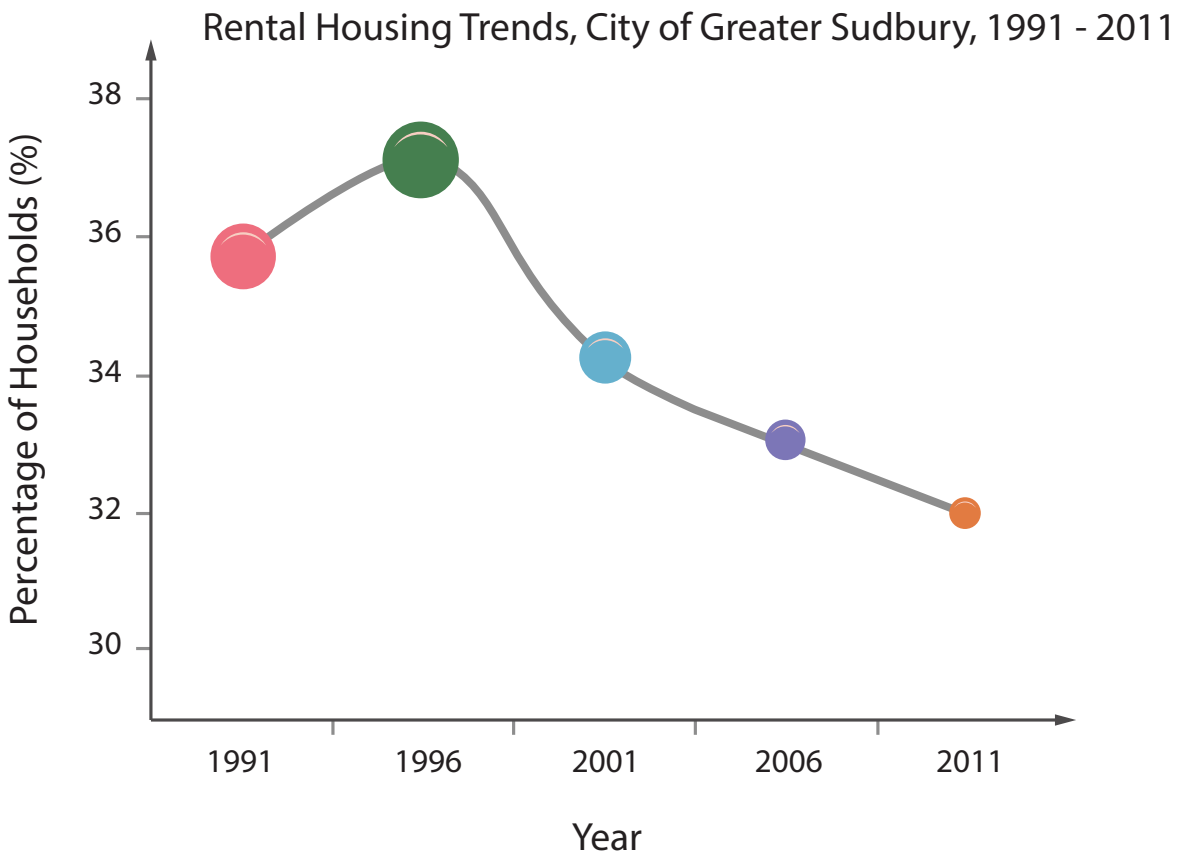


Market Analysis

Housing

This thesis project proposes that the Northern Brewery be converted into rental units that will include a mix of affordable housing and regular average-priced units. As of 2011, only 15.4% of housing was available as a 5-storey or less apartment building.[8] The city as a whole is looking to diversify the types of dwellings available to buyers and renters. To accomplish this goal while addressing the realities of the market, the existing complex will be converted into a 3-storey building, with the two upper stories being mixed-income housing and the ground floor reserved for the industrial and commercial functions. Similarly, there is an increased desire to rent in the area due to the increase in non-family and single households, students, seniors looking to downsize and the need for affordable and flexible housing for low-income families. However, this is not the current trend in Sudbury's market. Currently, there is a decrease in the number of rental units since 1996 as illustrated in the graph below.[9]

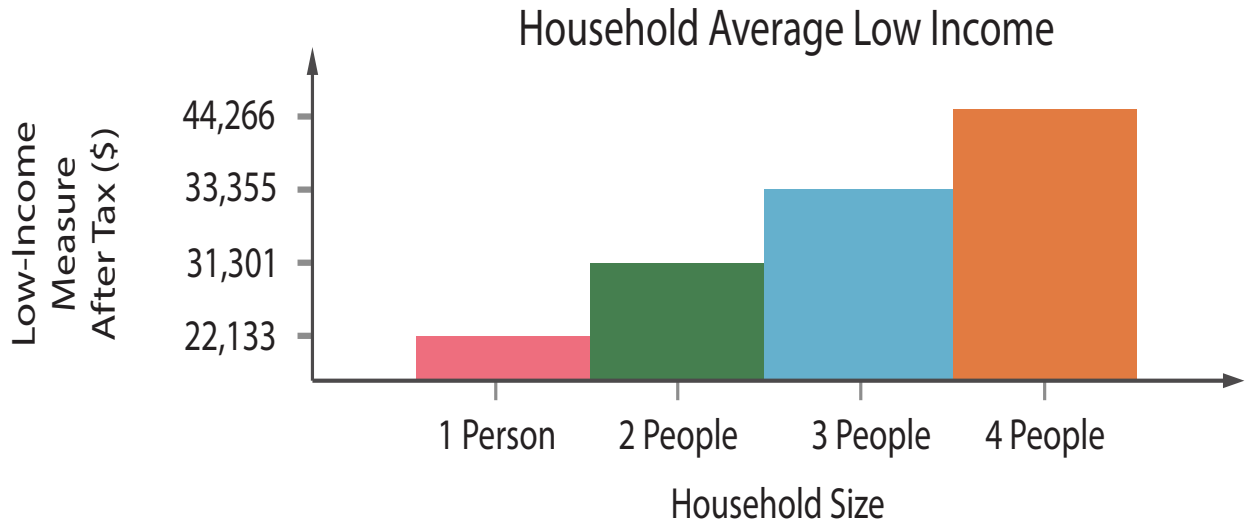
Figure 84:
Sudbury's Rental Housing Trends (1991-2011).



The area surrounding the Northern Brewery sits is a part of the city that suffers from poverty, defined by low-income households and homelessness. According to the 2016 census of Sudbury, 12.8% of the city's inhabitants live at or below the low-income level after tax.[10] The low-income measure for differing household sizes is seen in the graph below.[11]

Figure 85: The Northern Brewery photographed in 1967.

Figure 86: Graph of Low-Income Measured After Tax per Household Size.



This 12.8% of the population will suffer greatly from the lack of solutions to the issue of housing costs. The higher the cost to rent or buy real estate, the less money there is available to these people to cover the other basics of healthy and sustainable living. There is a market need for more affordable housing for these people, as seen through the analysis of the Brewery site and the research of the City of Greater Sudbury. As of 2012, only 30.4% of rental units, amounting to approximately 4381 units, were affordable or classified as social housing.[12] Creating affordable housing units not only benefits those with a low-income status, but may assist those suffering from homelessness have a greater chance of affording and finding a dwelling.

There are several market needs that must be addressed, which include:

- 1. The improvement of housing access and affordability for single and non-family households (31.8% of the market), as well as family households (68.2% of the market).[13]
- 2. The insufficient supply of accessible housing units.[14] Greater Sudbury projected a need for over 1,000 additional accessible housing units as of 2013, which has not yet been met.[15]
- 3. The limited number of student housing options to accommodate the increase in post-secondary options in Sudbury, i.e., due to the expansion of Laurentian University.[16]
- 4. The limited diversity in housing for seniors or those aging in place.[17]

The site located at Lorne offers the possibility of creating more affordable housing, as there is a large number of residents who are living under the average housing cost in the area surrounding it. Implementing a strategy with a direct connection to Sudbury will assist in creating a successful space where those living there will feel welcome and safe. As well, including public spaces to both the exterior and interior will also connect with the community and bring life to the surrounding area. In order to create a successful strategy to accomplish this, it is key to look at the current strategies of affordable housing in Canada, Ontario and in Sudbury and connect these findings with the needs of Sudbury today.

Affordable Housing in Canada's Urban Communities

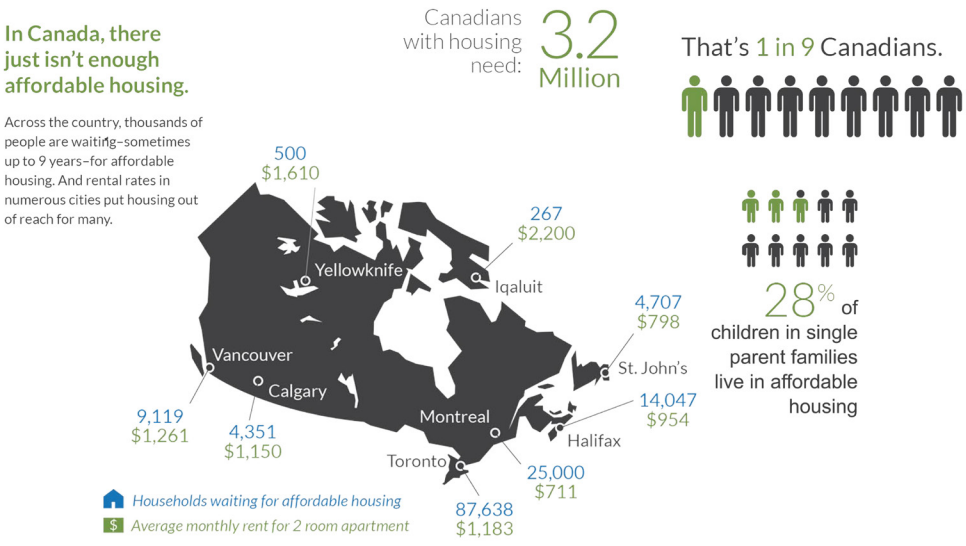
The Canada Mortgage and Housing Corporation (CHMC), which is the Government of Canada's national housing agency, wrote a report in 2003 titled, "Affordable Housing in Canada's Urban Communities: A Literature Review." In this research report, the company describes affordable housing as a major constraint to equalizing individual opportunities.[18] The CHMC analyzes affordable housing at the national and federal level, and presents inclusionary zoning as one of the main opportunities to strengthen the availability of affordable housing. Inclusionary zoning allows for more affordable housing units to be created through the development process. If passed, this zoning law allows all municipalities the ability to require developers to include affordable housing units in their development proposal.[19] Thus, the by-laws and programmes that require development proposals with residential units would include affordable housing units by default and would have to provide and maintain those units as affordable over an extended period. This approach combines housing policy and land-use planning approvals to require private-market development to include below market-rate rental and/or ownership housing.[20] The intent of the proposed inclusionary zoning authority is meant to assist in creating an area that can be better regulated and offer those less fortunate with a better opportunity for an improved quality of life in order to decrease economic stratification and social segregation.

CMHC also dives into urban revitalization and the need to enhance and utilize the informal network of residents and community groups, to build a sense of inclusion and empowerment.[21] For positive results, the overall connection to the culture, traditions, and resources of the neighbourhood need to be considered in the construction of affordable housing, including the coordination of services, supports, jobs, and schools.[22] The most significant aspect when designing affordable housing should be building a platform for the integration of communities, economic benefits, and social benefits that healthy communities offer.[23] Through these connections sites will be healthier and more secure allowing people to feel safe and happy. The creation of affordable housing can strengthen communities within Canada and result in cities that are prospering socially, economically and culturally, as having adequate housing is the foundation for social well-being.

Ontario's Long-Term Affordable Housing Strategy Update

The government of Ontario's first affordable housing strategy was released in 2010. Titled, "Ontario's Long-Term Affordable Housing Strategy Update," this strategy was formed to assist in strengthening dependable environments for families and children. The main objective for the strategy is to recognize local flexibility with accountability, offering the best approach to housing and service delivery.[24] One of the main factors in how Ontario has succeeded in their strategy occurred in 2016 when the province invested $178 million to create a portable housing benefit. As well, Ontario has invested up to $100 million in operating funding for housing allowances and support services.[25] Although this is a step in the right direction there is still a large disconnect between the province and the municipality. This can be shown through the Inclusion Act, which was passed in April 2018. The Co-operative Housing Federation of Canada introduced this Inclusion Zoning Act that allows municipalities to decide if new housing developments in their communities should include affordable housing.[26] Due to this being left a choice several cities, including Sudbury, have not chosen to push forward thus far. Ontario should move in to ensure that this act is in place within the municipalities, such as Sudbury. Overall, Ontario has created this strategy to implement inclusionary zoning for all municipalities, finance cities, improve delivery and administration of social housing and create a portable housing benefit that can sustain all who struggle and cannot sustain their own lives. Through further connecting with municipalities and the assurance of new construction of affordable housing, we can then begin to strengthen and revitalize the society as a whole.

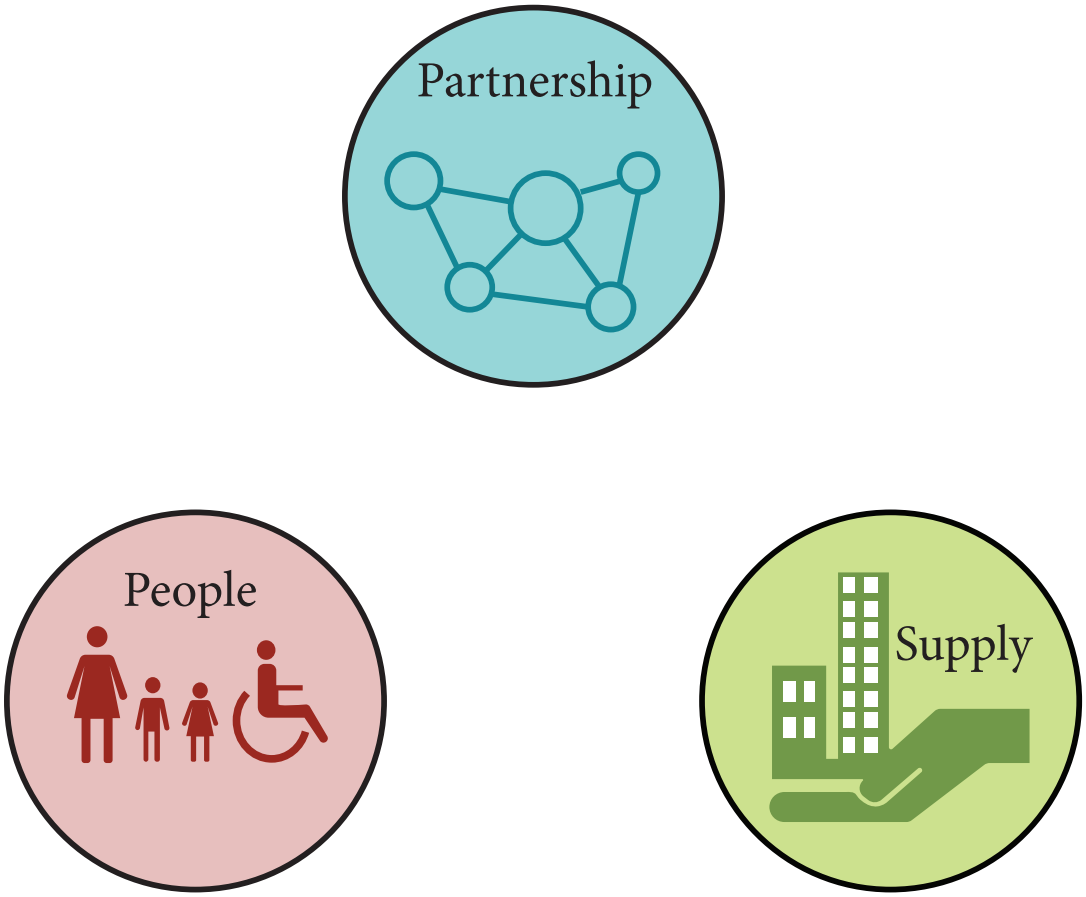
Figure 87: Affordable Housing in Canada.



Ministry of Municipal Affairs and Housing Long Term Goals

- Ensuring all individuals can afford to live
- An appropriate and sustainable supply of housing
- Working with partners/corporations to give a better outcome for all Canadians
- An equitable, portable system of financial assistance
- People-centered, efficient housing programmes
- Achieving an evidence-informed system

Figure 88: Ministry of Municipal Affairs and Housing Long Term Goals.



City of Sudbury Housing Background Study 2013

In 2013, the City of Greater Sudbury produced a study titled, "City of Sudbury Housing Background Study." This document was meant analyze the current living status of those living in Sudbury and specifically, the areas of living that need improvement. The study found that there is a need to improve housing options across the housing spectrum. Most rental housing or affordable housing options are described as being in poor and unsafe conditions.[27] As well, there is a lack of support for seniors, those with special needs and those who cannot afford the average cost of housing.[28] Through analyzing the needs of Sudbury the city has concluded that there needs to be a greater coordination and collaboration among a broad range of stakeholders involved in housing and to improve effectiveness of the local housing system.[29] Although this connection between stakeholders offers a strong case to revitalize affordable housing, Sudbury still has not set out a plan as to how this will unfold. In the next eight years, the population living in rental units are projected to grow by 32% and strategies need to be created in order to prevent families and individuals from finding themselves in the situation of not being able to pay for a dwelling and in ensuring there are enough spaces for this influx of people.[30] A stronger connection to the Ontario government, the acceptance of the Inclusionary Zoning Act, and a better strategy to bring private investors into the market of affordable housing will allow Sudbury to regenerate and be a support system for those who need it most. Sudbury has attempted to address these issues with the institution of a set of "Community Improvement Plans", including one focused on affordable housing. This particular plan aims to enable the expansion of affordable housing, outlines the requirements for affordable housing in Sudbury, and encourages the maximization of "existing infrastructure."[31] Similarly, those who undertake projects that meet the affordable housing requirements may be provided with financial incentives from the city, including grants and loans. In 2019, the project looks to gain $1,000,000 from the Social Housing Capital Reserve Fund to assist in this process.[32]

Figure 89: Preventing homelessness infographic.

Beer-Making

The Northern Brewery was once a functioning and thriving brewery and it has the potential to reach this point again, particularly through the production of craft or specialty beer for which there is a market for in Sudbury. The Northern Brewery location is profitable as it is located on a major street and is close to the downtown core. Moreover, marketing to the young population of the downtown with a brewpub featured within the new brewery would attract even more people. In an ideal situation as presented in this thesis, Stacks Brewery would see this potential and agree to partner with the owner to finance, operate and reap the benefits of this regenerated brewery. Stacks Brewery is the only brewery that mass produces craft beer, established as of 2013, in Sudbury.[33] Thus, the competition, due to partnering with this company, would be minimized.

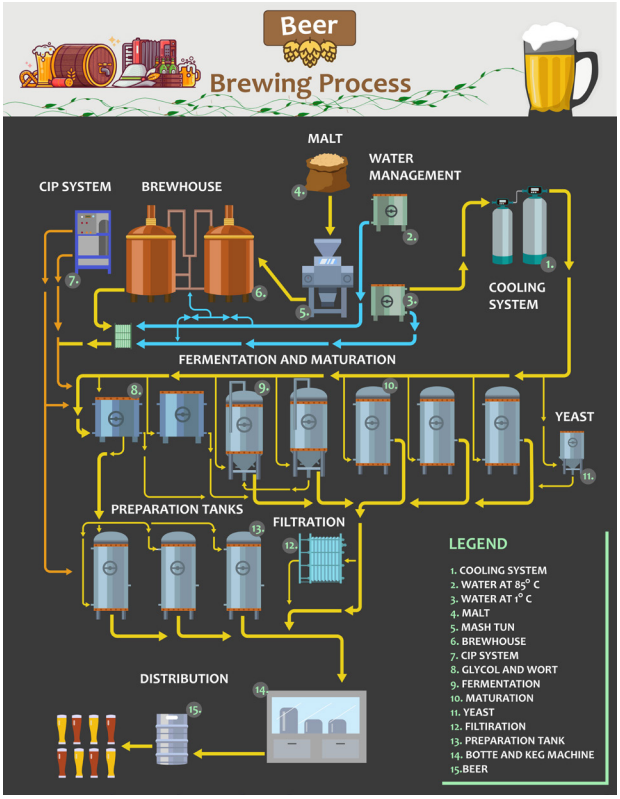


Figure 90: Beer production infographic.

Having the Northern Brewery operate anew as a brewery would tap into a thriving market while also evoking the site's industrial history. Beer is Canada's most popular drink and there is a high demand for craft beer in Northern Ontario, which is Stacks Brewery's speciality.[34] Overall, as of 2018 there has been a 12-15% increase in craft beer consumption in Canada and this is projected to continue to rise.[35]

Figure 91: Northern Brewery tank seen c. 1910.

Plans of the Proposed Apartment Units

The ground floor of the Northern Brewery will become an industrial and commercial space to produce and sell Sudbury's Stack Brewing products. This floor will also include a restaurant and pub, and a small administrative zone. With Stack Brewing being such a prevalent industry in Sudbury it has resulted in the company's need for expansion. The Northern Brewery can act as a spot where seasonal and experimental beer can be produced and tasted. The main appeal to the public within the building will be the visual connection between the brewery and the restaurant, where customers will be able to view the process of the brewing of Stack's beer from both the outside of the building and from within. This approach of commercial spaces known as a brewpub has gained popularity in the last ten years. In several Canadian cities, the brewpub is able to act as central destination that has the possibility to strengthen the surrounding area and allow for more commercial stores for the public. Through incorporation of the income-generating brewpub at the Northern Brewery, the financial losses associated with sub-market-value housing will be offset. This hybrid programme, therefore, allows the revived complex to be financially self-sustaining.

The images found on the right indicate the number and placement of the bachelor, one- and two-bedroom units that are located on both the second and third floor of the Brewery.

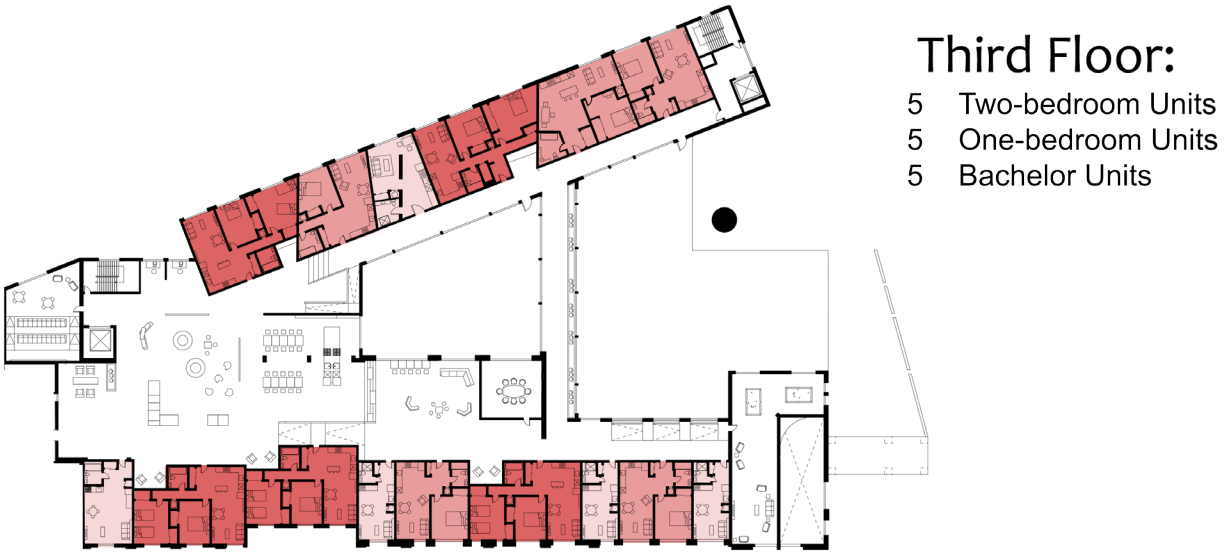
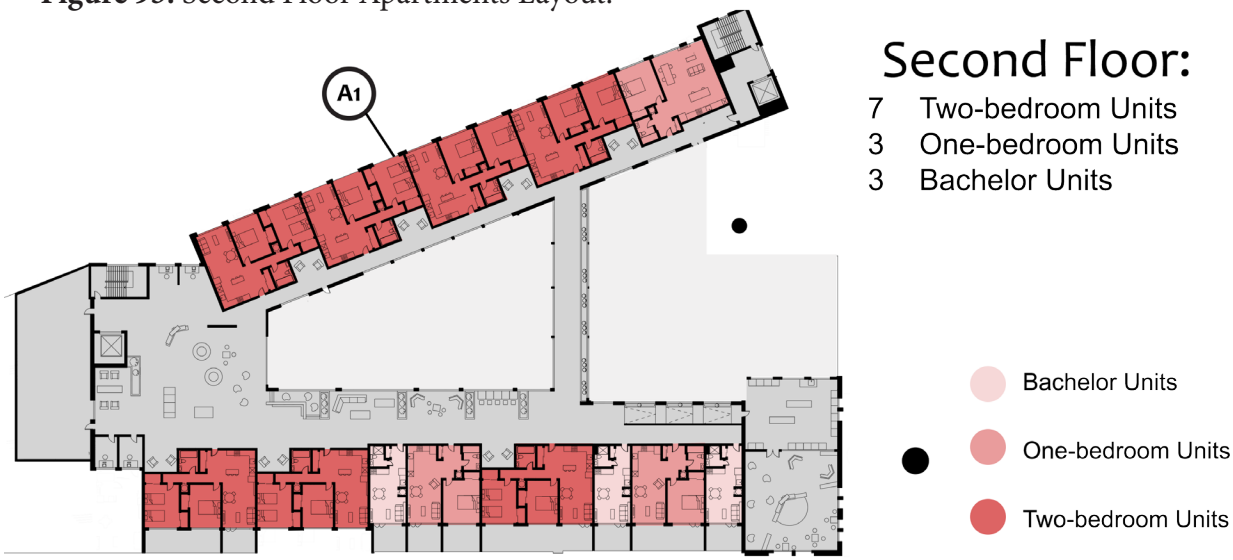


Figure 92: Third Floor Apartments Layout.

Figure 93: Second Floor Apartments Layout.



Bachelor Units

These units are open concept with a sectioned-off bathroom with shower and bath combination. The open concept layout features a pull-out wall bed and room for a dining or kitchen table and desk. The apartment's floor area is small but can be utilized efficiently.

Figure 94: Plans of bachelor apartments.

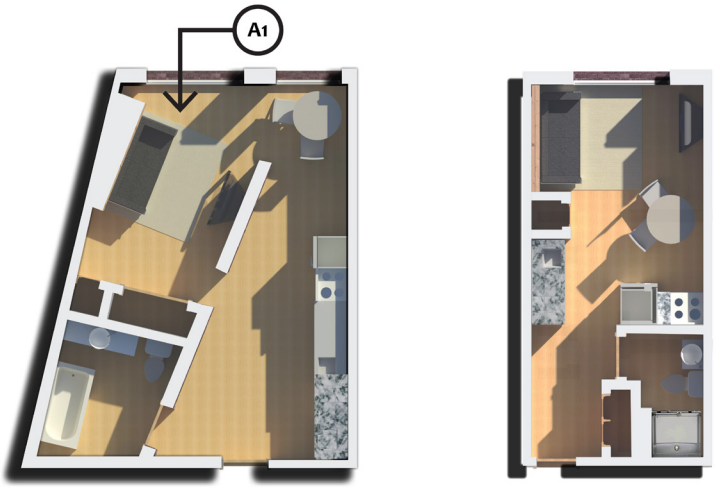
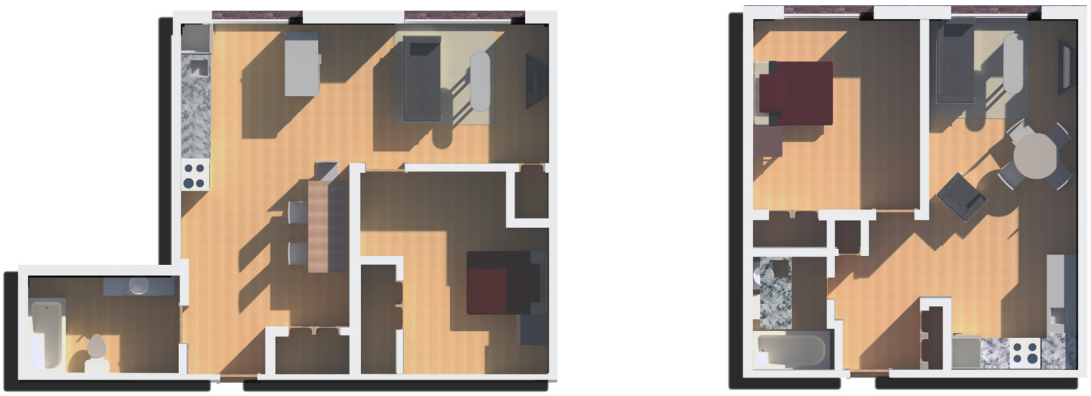


Figure 95: Interior rendering of a bachelor apartment.

One-bedroom Units

The market-priced one-bedroom units have the same plan as the affordable one-bedroom units but also include a balcony. These units feature an open concept kitchen and living room that has enough space for a dining table with two chairs, a small couch and wall unit. There is one bedroom that can comfortably fit one double bed and a bathroom with a bath and shower combination.

Figure 96: Plans of one-bedroom apartments.



Two-bedroom Units

In these units, the space is divided into two bedrooms, which are large enough that one bedroom or both can house two beds if necessary, a bathroom with bath and shower combination, and an open concept living area and kitchen.

Figure 97: Plans of two-bedroom apartments.

Finances: Offsetting Costs

Adaptive Reuse

Adaptive reuse projects can save money during the construction process by lowering the demolition costs in comparison to removing a building and starting with entirely new construction.[36] Thus, the adaptive reuse of the Northern Brewery would assist in reducing costs alongside retaining an important icon in the urban landscape that speaks of the city's history. Moreover, the economic benefits of an adaptive reuse project are more than just for the site owner themselves but also benefit the local area. This includes the increase in jobs created as there needs to be more people working on this type of specialized project in order to ensure the building is properly protected.[37] It is also beneficial as typically the labour hired are from the local community. The money paid for labour in a reuse project stays within the community and increases the economic investment in the area.[38]

The costs can also be limited by adaptive reuse as there is a reduction in the hazardous materials created and used in these projects.[39] Thus, there are fewer costs in the removal and use of these types of environmentally negligent materials. Similarly, adaptive projects preserve the energy expended in the original creation of the building, thus saving the need to expend copious amounts of more energy. This is called the preservation of the "embodied energy," which is defined as,

> "the quantity of energy required by all activities associated with a production process, including the relative proportions consumed in all activities upstream to the acquisition of natural resources and the share of energy used in making equipment and other supporting functions, i.e. direct plus indirect energy."[40]

Therefore money, time and energy are saved by not having to undergo all the same activities again. Overall, these factors make the adaptive reuse project at the Northern Brewery more sustainable and less expensive.

Available Incentives

The following are a list of available incentives that the Northern Brewery project will apply for to offset construction, and the hard costs and soft costs for development, ensuring the affordable housing units can be as affordable as possible and that there still can be a profit margin for the microbrewery.

Provincial Level: Ontario

1. Rental Housing Funding: Properties can apply for a forgivable capital loan that is available during the construction phase of the project in which the Investment in Affordable Housing Project from 2014-2020 will pay for up to 75% of the total capital cost per unit or $150,000 per unit or whatever is less.[41]

Municipal Level: Sudbury

1. Tax Increment Equivalent Grant: A grant that is equivalent to the incremental increase in the property taxes and revenue resulting from the improvements made to the property, including new construction for up to five years. In the first three years of the programme, the grant will be equal to 100% of the tax increment, however in the fourth and fifth years the grant decreases to 50% of the tax increment.[42]

2. Planning and Building Fee Rebate Programmes: This programme assists in paying the municipal fees related to the development and redevelopment of the building in high priority areas including:

a. Official Plan Amendments
b. Zoning Amendments
c. Minor Variances
d. Consents to Sever Land
e. Site Plan Control Agreements
f. Building and Demolition Permits
g. Sign Applications[43]

3. Feasibility Grant Programme: This grant will provide projects of adaptive reuse or redevelopment of buildings within the project area up to $5000.[44]

4. Residential Incentive Programme (per-door grant): This programme will provide a grant per square foot of affordable housing space or $20,000 per affordable housing unit, whichever is lesser, after occupancy is confirmed.[45]

Brewery and Pub

The brewery will create revenue from craft beer sales after production takes place. Similarly, the pub will generate further revenue from sales of beer and food in house. These two forms of income will assist in the Northern Brewery location generating profit, offsetting costs and being self-sustaining. The brewery will also be as sustainable as possible, cutting costs even further. This will include the donation of used grains to local farmers, the use of energy-efficient manufacturing processes and the use of local ingredients and capital.

Affordable Housing

Affordable rental housing is defined as the least expensive of:

a. A unit for which the rent does not exceed 30% of the gross annual household income for the low-income household;

or

b. A unit for which the rent is at or below the average rent of a unit in the regional market area.

Thus, in order to determine whether the rental price of the affordable units in this project will be priced according to a or b from the above definition, the following chart has been constructed.[46]

Figure 98: Analysis of Rent for Affordable Housing in Sudbury.

Household Size	Average Annual Low Income[47]	30% of Annual Gross Low Income Per Month	Average one-bedroom Rent in Sudbury	Average two-bedroom Rent in Sudbury
1 Person	$22,133	$555	$870	
2 People	$31,301	$780	$870	
3 People	$38,355	$960		$1,350
4 People	$44,266	$1100		$1,350

From the above chart, the average rent for a one-bedroom unit in Sudbury averages at approximately $870 and a two-bedroom unit averages at approximately $1350. If the average rent per month in Sudbury is compared to the value of 30% of gross low income per month, it is clear that the average rent in Sudbury is more expensive than those in low-income households can afford, regardless of size. Thus, the rent of the affordable housing units at the Northern Brewery must be priced at or below the least expensive value, which in this case is 30% of the gross low income per month value. For a one-person household this is $555, for a two-person household this is $780, for a three-person household this is $960, and for the four-person household this is $1100.

Presuming that a one-bedroom housing unit is rented by approximately two people from the chart above, it is clear that the one-bedroom affordable units must be priced below $870. This will ensure that they are priced at 30% of the resident's gross annual income. Thus, from this information the approximate rental price per one-bedroom affordable housing unit will be $780 a month.

Moreover, presuming that a two-bedroom housing unit is rented by approximately four people, from the chart above it is clear that the two-bedroom affordable units must be priced below $1350. This ensures that they are priced at 30% of the resident's gross annual income. Thus, from this information the approximate rental price per two-bedroom affordable housing unit will be $1100 a month. The other units will be priced at the average rental price for the area, allowing for these units to generate profit and help sustain the building.

Figure 99: Units and the Rent per Month at the Northern Brewery Housing Complex in Sudbury

Unit Type	Number of Units	Rent per Month
Affordable one-bedroom	4	$780
Affordable two-bedroom	6	$1,100
Bachelor (appropriate for post-secondary students)	8	$780
One-bedroom	4	$900
Two-bedroom	6	$1,350

Endnotes

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06
DESIGN

Adaptive Reuse Strategy

For the Northern Brewery, the site offers a unique method of adaptive reuse as the site calls for the preservation of the fragments that once existed, in order to create a cohesive whole. The Northern Brewery itself is not a complete fragment, it does not lack walls or pieces of the exterior, but it is made up of multiple fragments of what once existed, defined by their heights, as it lacks a functional interior and its incompleteness, or ruin, leaves it uninhabitable. The uninhabitable quality of the building leads to the adaptive work to the structure to be an intervention entailing, adding or taking away from the fragments to create a new state of completeness. This intervention, however, never takes away from the importance of the individual fragments or the historic value they have.[1]

Through the study of the host building, it emerges that a key aspect defining the overall structure is the varying levels of (and disconnections between) the floors that were developed as the building changed over time to fit its evolving purpose. Although these discrepancies in floor levels may be seen as a nuisance, the fragments they physically create provide the opportunity to experience the past building through the connection to the original material and programme of the host structure. This preservation of the host structure's idiosyncratic floor levels, as well as the retention of as many interior walls as is feasible, will reflect the collective history, materials and memories that once existed at the site. This reflects the importance of the collective memory, over the historical memory. As within the site and surrounding area, "people worked there, lived there, and are still there. Communities saw and maybe see again future in [the] familiar yet industrial built forms."[2] Similarly, it will allow new users to experience the past within the newly consistent and functioning whole as the mixed levels and character of spaces will impact and reflect the mixed usage of the building.

The revived Northern Brewery will act as this bridge between the old and new as it sits near the downtown but is currently blocked off from it by the industrial railway yards. The newly created structure will act as a collective gathering space for users and will assist in the regeneration of the built environment in physical, ecological, cultural, and socioeconomic terms.

Collective memory is the intersection of individual memories, gestures, spaces, and characteristics within an area and between groups of people who interact in a way that creates a commonality of memory and culture. This allows an individual to maintain their personal identity while also remembering or acting within the group.[3] For the Northern Brewery, the collective memory is important as it will allow those who engage with it to understand one another better and strengthen their sense of community. It also will help individuals negotiate between Sudbury's historical and current social conditions, as it allows for a process of learning from the past and analyzing the present or future by shifting interpretations and developing new perspectives through the lens of collective memory.[4] Overall, the experience of the new Northern Brewery can regenerate the area in socio-cultural terms as it breaks down the barriers between people of differing backgrounds particularly in terms of socio-economics, by providing them with a common space with linked memories and spaces to inhabit, work and gather together.

For the physical building, collective memory is inherent within it as the previous purpose of the building is ingrained within the structure and every change or expansion the structure has undergone has a physical reminder. For instance, in the design of the new Northern Brewery the iconic barley malt silo and smoke stack are kept in order to highlight the brewing process and original programme of the building. Preserving the elevations and original materials, such as some of the brickwork, will reflect these memories and the history of the site physically, while adding new materials that provide opportunities for a diverse set of users will also regenerate the space. These new materials will address the socioeconomic concerns of the area by providing a modern programme for both the mixed income housing and brewpub. Thus, the new building will always retain a memory of, while surpassing, the original value of the structure.[5]

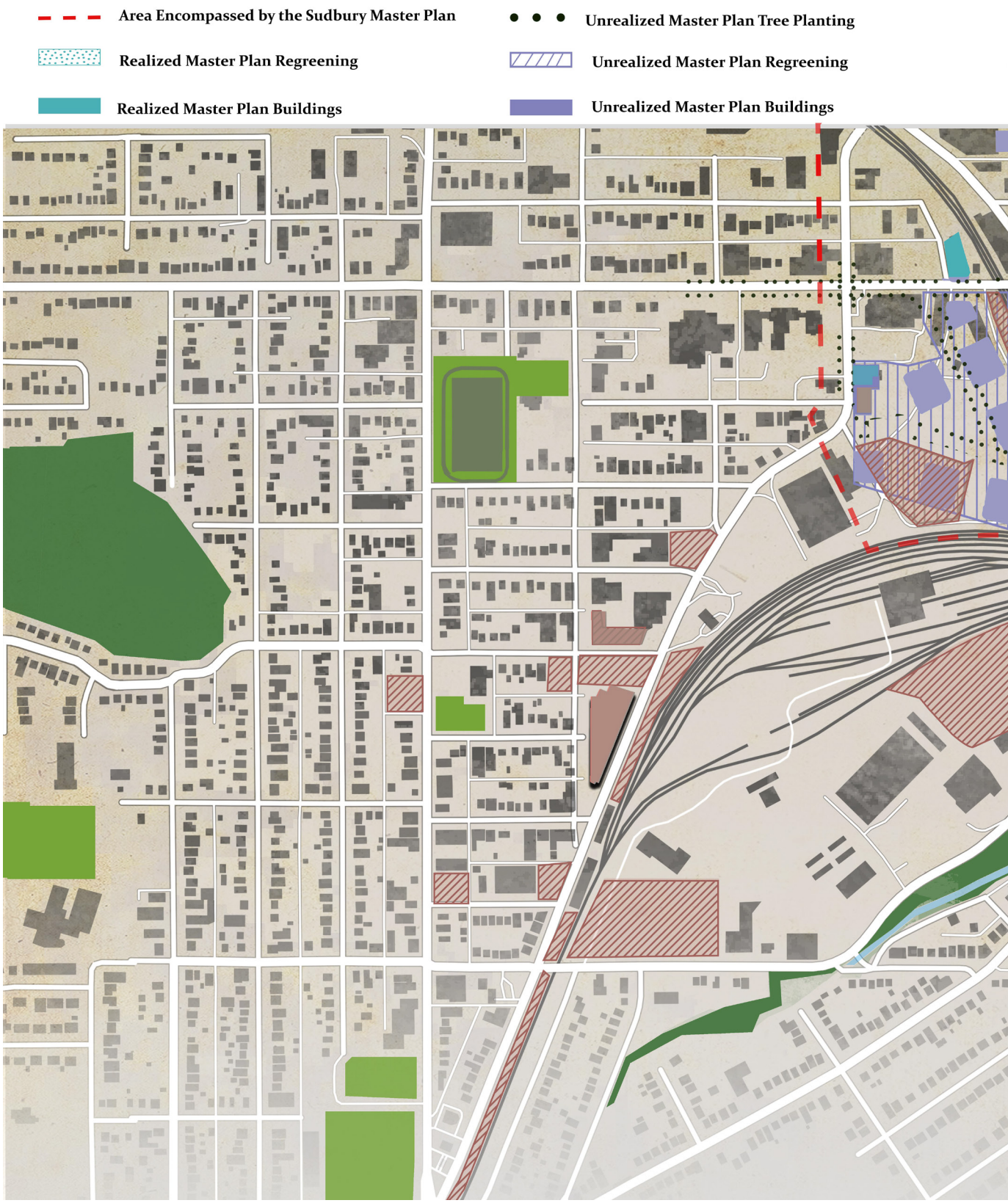
By implementing the strategy of adaptive reuse within the Northern Brewery it will also be able to affect the surrounding area on a sustainable and ecological level. As discussed before, adaptive reuse is a sustainable method of architectural design, both ecologically and economically, as it decreases the amount of waste created, new materials used and protects the energy expended in the evolution of the building. The creation of a welcoming public park, a green space for residents on the roof and the green wall on the north facade not only highlight to the public the importance of eco-friendly buildings but also enhance the visual appeal of the space, providing opportunities for raised garden beds for small-scaled urban agriculture, and air cooling which counters urban heat build-up from the proximal downtown core. This much-needed re-greening will extend past the building, regenerating the surrounding area on an ecological level.

In conclusion, the adaptive reuse strategy for the Northern Brewery is a collective process of bringing together the history, memories and materials of the host structure, which can be reflected in each of the new spaces created in the building. These new spaces utilize the pre-existing elevations of the site, showing how the building has progressed into the future and how the surrounding area can as well, by creating regeneration on cultural, ecological, socioeconomic, and physical levels.

Sudbury's Current Condition and Future Plans

The City of Greater Sudbury's Master Plan was meant to revitalize the downtown core and the overall community. Since the inception of the Master Plan, the city has little to show for their good intentions. Even more, there continues to be a disconnect between the downtown core and the west of the tracks. The adaptive reuse of the former Northern Brewery contributes to changing the way many people will perceive downtown Sudbury and increases the value and appreciation of the surrounding area and community. Figure 100 consolidates information to show the scarcity of public green space, the building plans and re-greening ambitions that had been identified in the city's Master Plan yet which remain unrealized, and other vacant lots and buildings in and around downtown.

The revitalization of the specific site of the Northern Brewery aims to connect the community through the creation of a public park, pleasant and shaded walking paths and different seating options. In addition, the fortress-like opacity of the building is rendered more porous through the covered exterior corridor, cut through the building to connect Lorne Street with the residential streets on the other side of the complex. This path not only lines up with Alder Street but also provides pedestrian access to the new restaurant. On the southern edge of the site, community members are offered seating and raised gardens as they wait for the municipal bus. Finally, the green roofs that are located on the second floor give further emphasis to the importance of sustainability and of re-greening post-industrial urban landscapes. The southern green roof is accessible by the residents and has multiple seating options, barbeques and raised gardens. The roof also offers a place for children to play, as well as storage for more seating and gardening equipment. On the third floor is a patio overlooking the green roof with two barbeques and different seating options.


Area Encompassed by the Sudbury Master Plan
Unrealized Master Plan Tree Planting
Realized Master Plan Regreening
Unrealized Master Plan Regreening
Realized Master Plan Buildings
Unrealized Master Plan Buildings

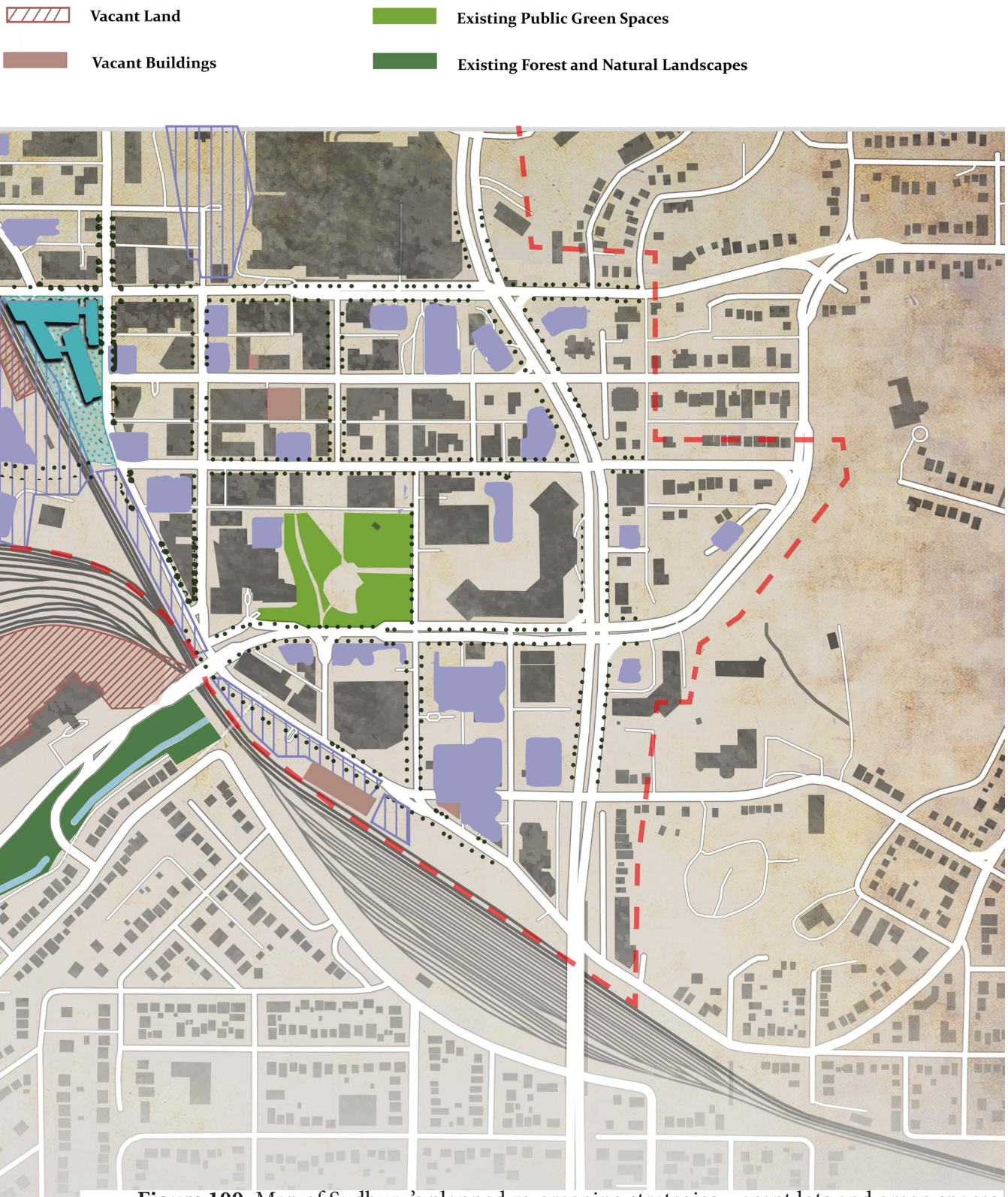


Figure 100: Map of Sudbury's planned re-greening strategies, vacant lots and green spaces.

Site Plan

Figure 101: Site plan of the Northern Brewery site post-adaptive reuse.

Schematic Design

The programme of the first floor is made up of commercial spaces for the public, industrial spaces for the production of beer, and employee spaces. The new brewery replicates the procedure that was once there. The restaurant has two main entrances from the exterior each offering a different experience of the host building. From the north entrance, users enter the building by passing under the Northern Brewery's iconic barley malt silo into a café space, before entering a long corridor that gives glimpses into the brewery before they reach the bar and restaurant.The southern entrance on Alder Street, accessed from the residential zone or by using the covered exterior corridor through the building from Lorne Street, offers direct access to the restaurant. On the first floor there is also parking and bicycle storage for the residents that is detached from the brewpub.

The second floor consists of bachelor, one-bedroom, and two-bedroom rental units with several communal spaces with different programmes that encourage neighbourly interactions and a sense of inclusion. These spaces include a public kitchen, play room, study room, games room, a theater and a green roof space. The third floor offers a similar experience to the second with several communal spaces alongside the residential units. This includes play spaces, washer and dryer room, open spaces with couches and chairs, and a patio.

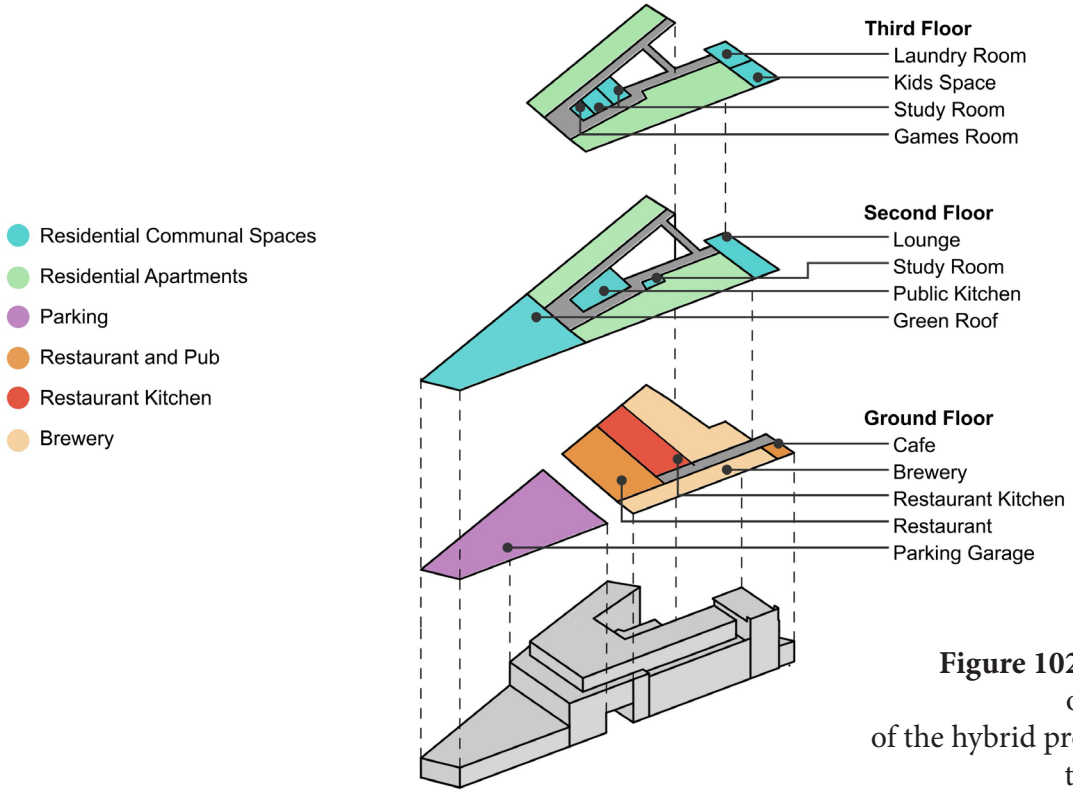
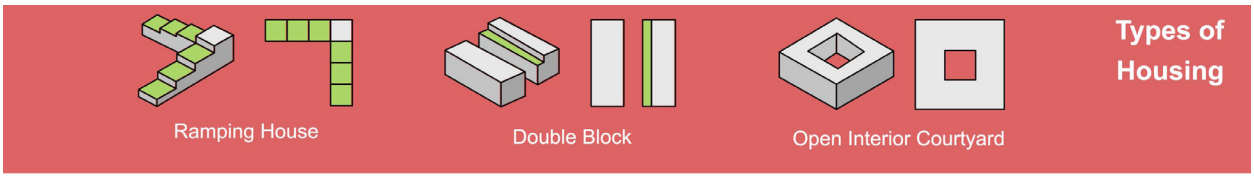
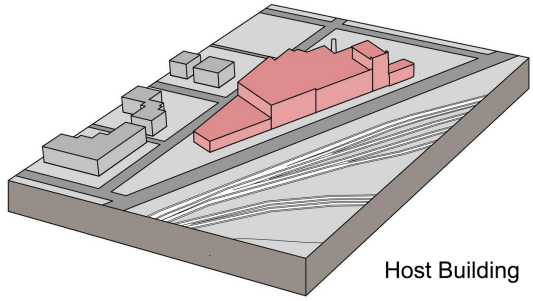
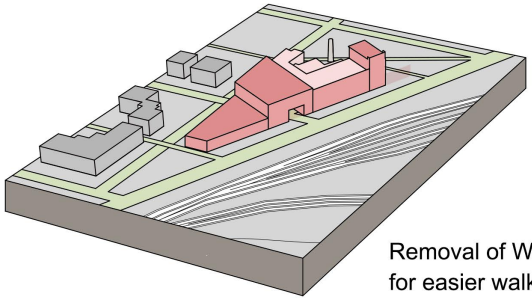


Figure 102: Schematic organization of the hybrid programme of the building.

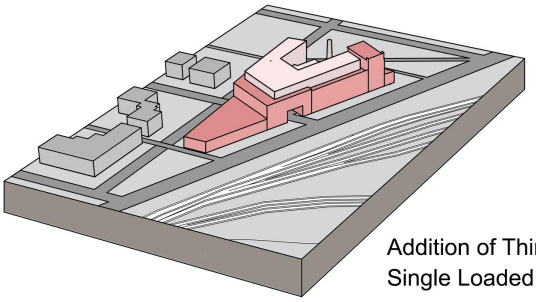




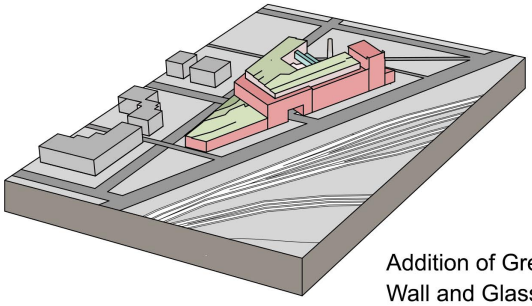
Host Building



Removal of Walls to allow
for easier walkability



Addition of Third Floor
Single Loaded Corridors



Addition of Green Roof,
Wall and Glass Hallways

Figure 103: Revitalization and hybrid programme of the building.

Adaptive Reuse Strategy Plans

Ground Floor

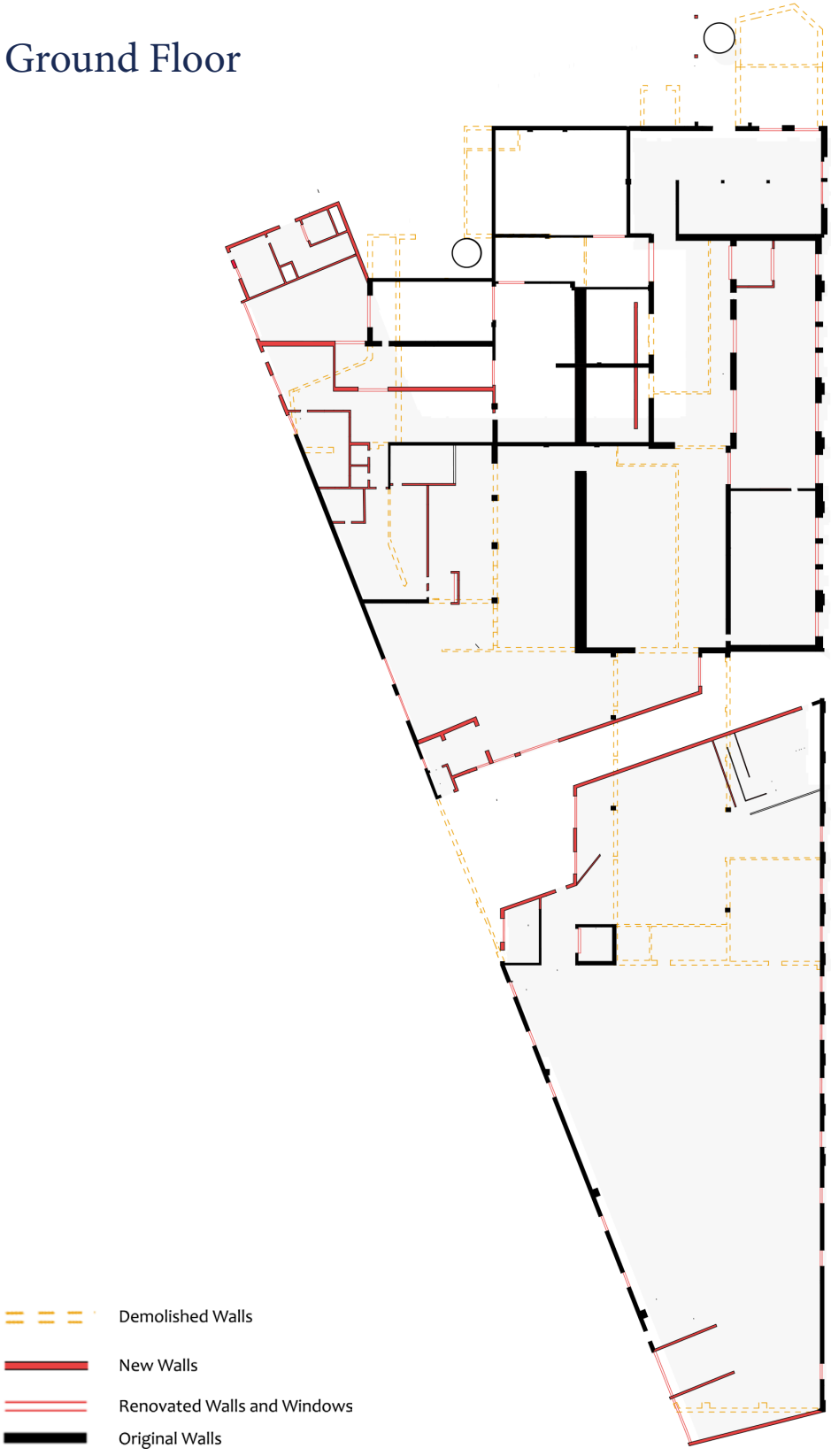


Figure 104: Adaptive reuse strategy for the ground floor plan.

Second Floor

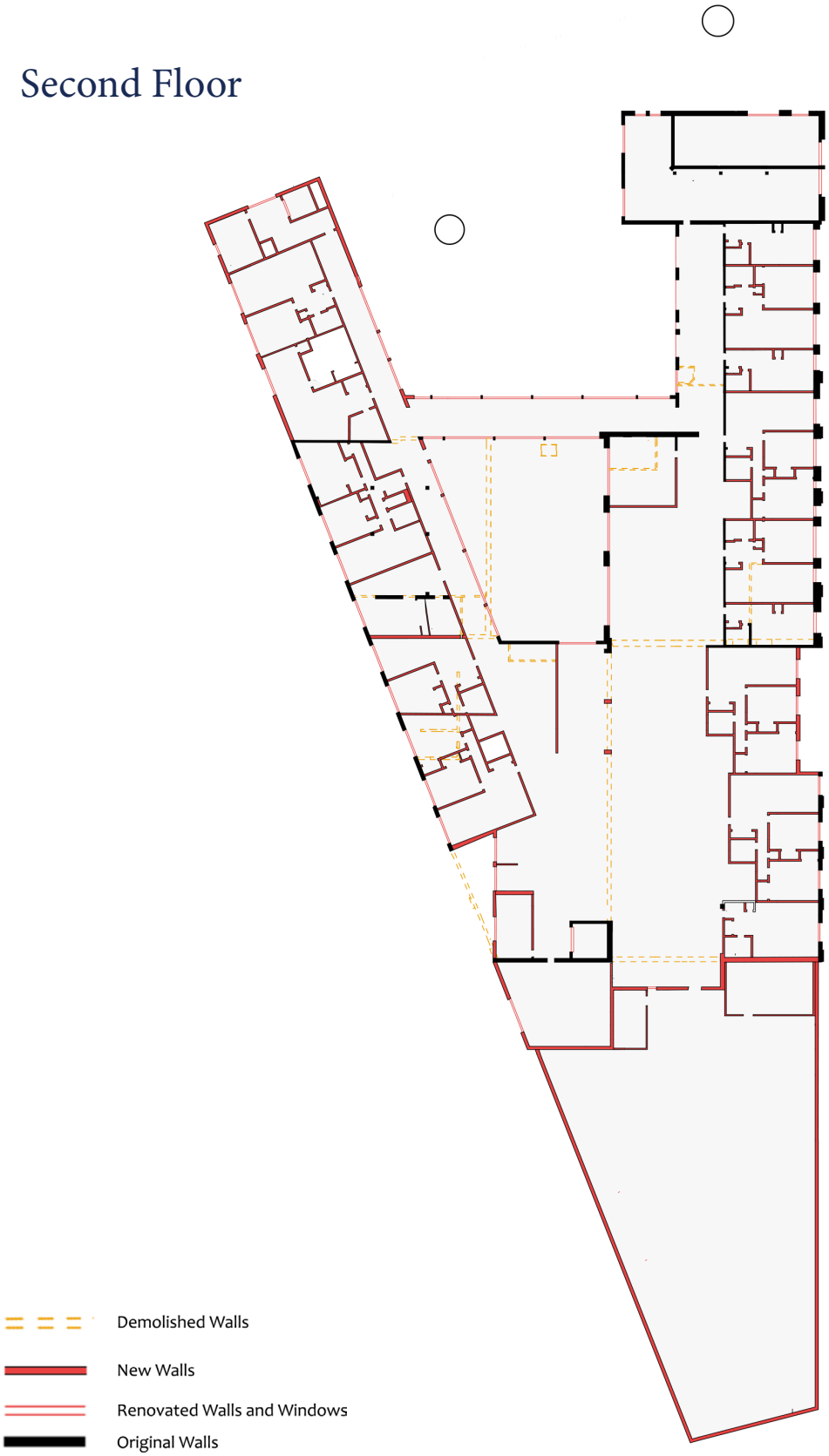


Figure 105:
Adaptive reuse strategy for the second floor plan.

Third Floor

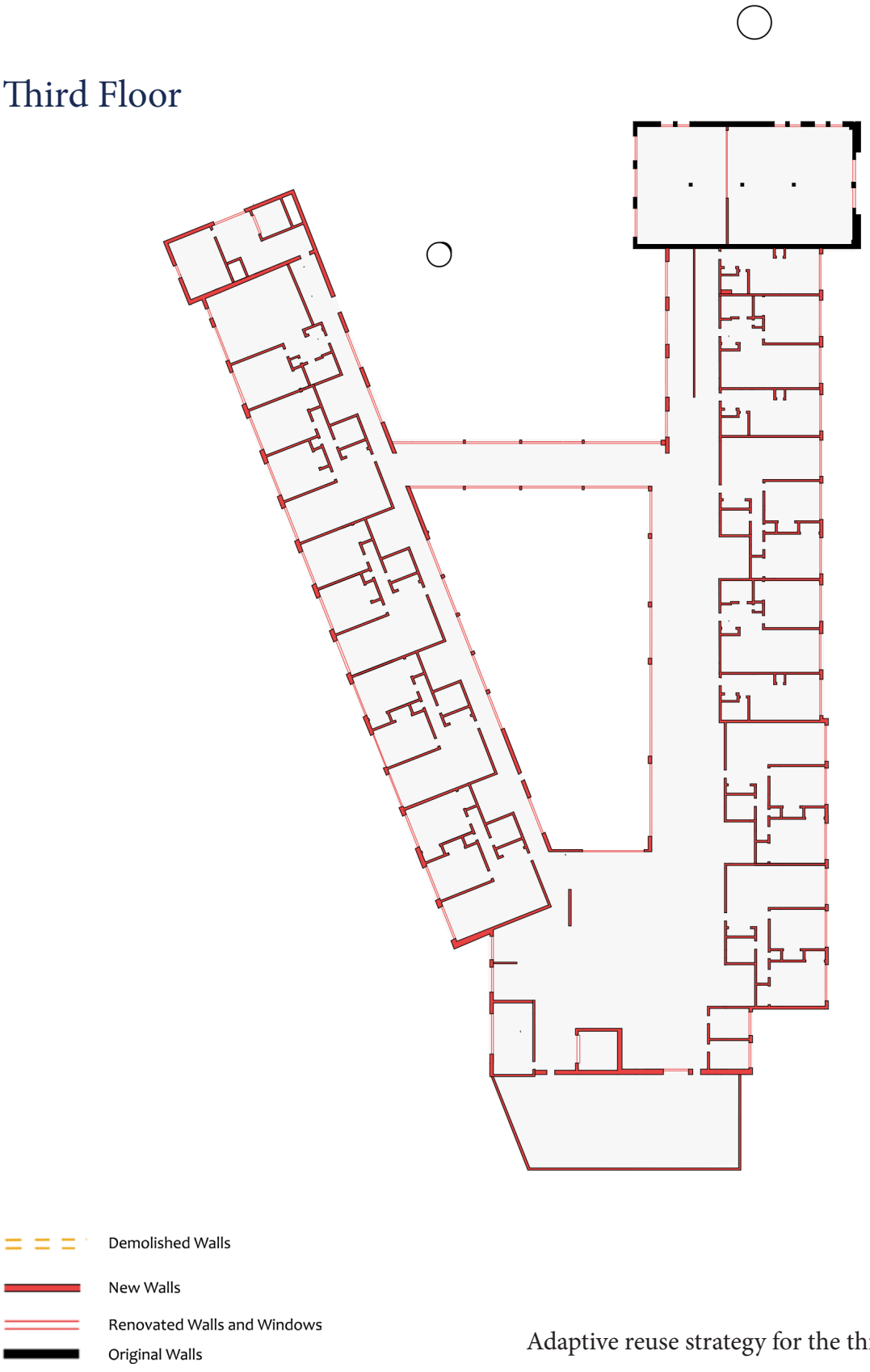


Figure 106:
Adaptive reuse strategy for the third floor plan.

First Floor Legend

1 Main entrance and café
2 Brewery tour waiting area
3 Men's washroom
4 Women's washroom
5 Pub
6 Restaurant
7 Lobby
8 Entrance to restaurant (vestibule)
9 Service entrance
10 Malt and mashing stations
11 Lautering and hopping stations
12 Fermentation stations
13 Micro-fermentation stations
14 Brewery cold cellar
15 Beer packaging
16 Brewery cold cellar
17 Brewery storage
18 Shipping and receiving
19 Employee entrance
20 Employee meeting space
21 Employee washrooms
22 Employee kitchen
23 Restaurant pantry
24 Restaurant cold cellar
25 Restaurant kitchen
26 Residential stairs and elevator
27 Residential stairs and elevator
28 Parking garage
29 Bicycle storage

Programme Legend

Public Programme
Brewery Programme
Employee Programme
Residential Programme

Floor Plans

Ground Floor

Figure 107:
Ground floor plan.

Second Floor Legend

1 Residential stairs and elevator
2 Glass corridor with raised garden
3 Games room
4 Study room
5 Lounge
6 Communal kitchen
7 Communal kid’s space
8 Study area
9 Residential stairs and elevator
10 Lounge
11 Theater
12 Storage
13 Garden storage
14 Green roof park
15 Barbeque and seating
16 Raised garden
17 Gazebo and seating
18 Closed off green space
19 Closed off green space

Programme Legend

Residential Programme

Green Space

Second Floor

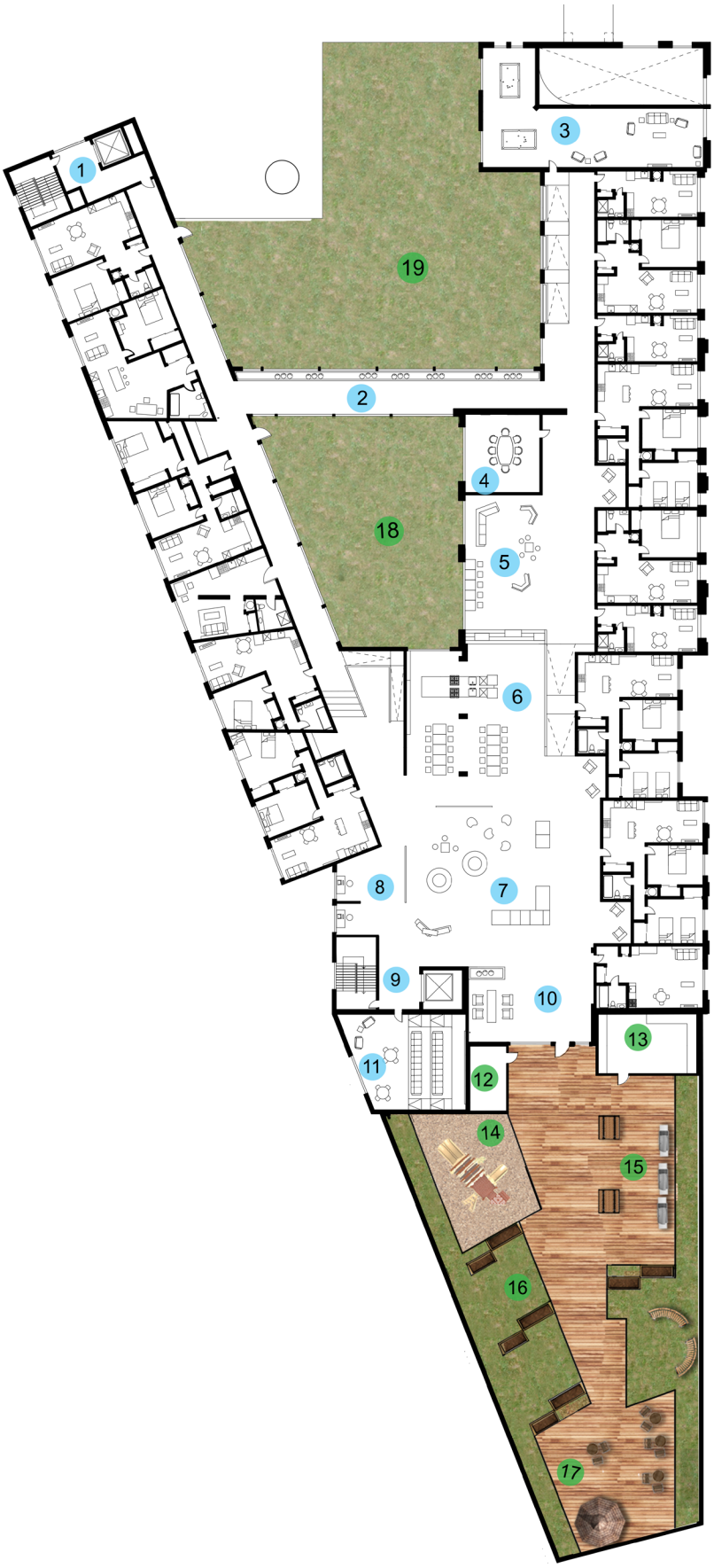


Figure 108:
Second floor plan.

Third Floor Legend

1 Residential stairs and elevator
2 Glass corridor with raised garden
3 Laundry room
4 Kid’s space
5 Lounge
6 Open kid’s space
7 Study area
8 Lounge
9 Study room
10 Residential stairs and elevator
11 Patio with barbeque and seating
12 Closed off green space

Programme Legend

Residential Programme

Green Space

Third Floor

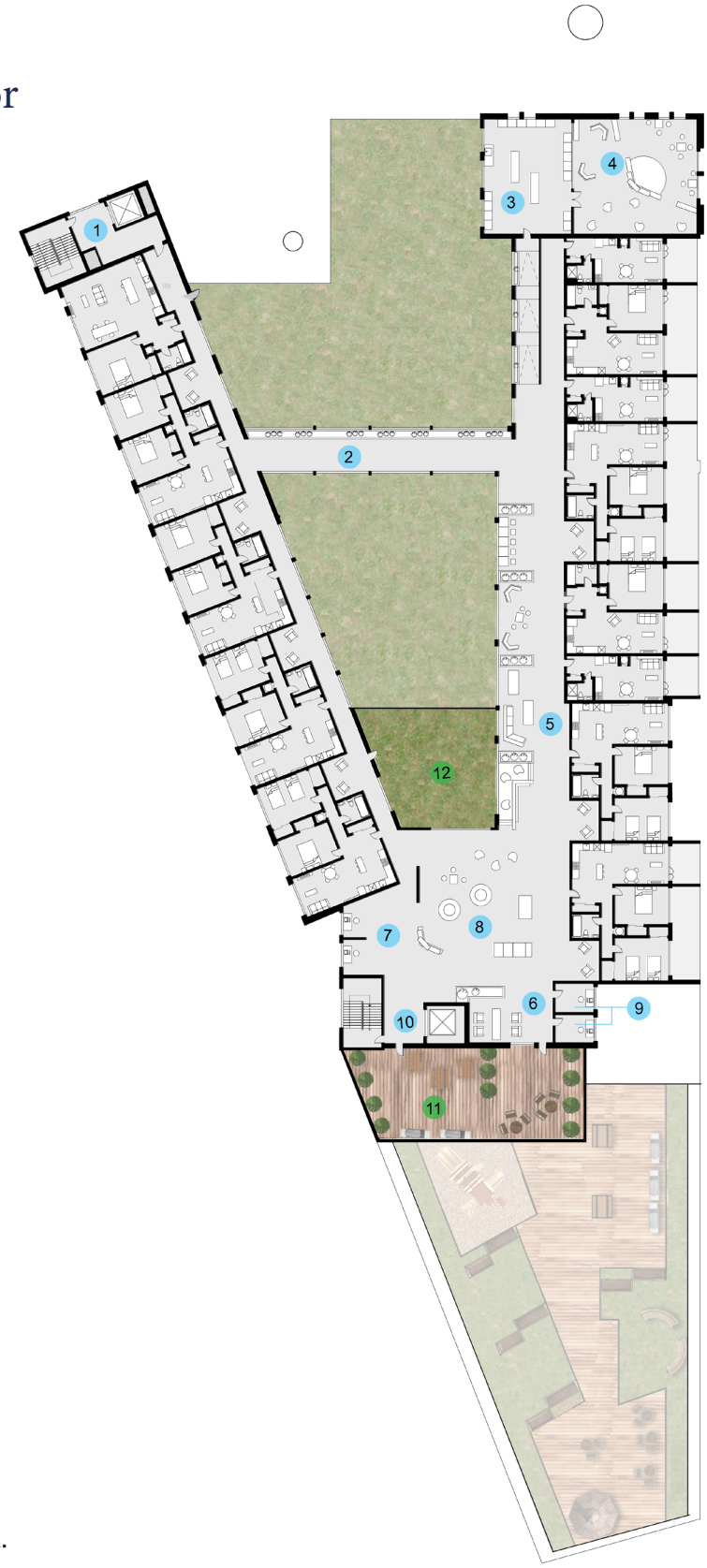


Figure 109:
Third floor plan.

North Elevation

The overall strategy for the adaptive reuse of this industrial building is to inject it with new programmes and render the massive elevations more porous while revealing the original structure and tectonic logic of the original building. Through the use of wood for the new residential storey on the third floor, which is set back from the host building, the structure is visually lightened while still respecting its heritage. Moreover, with the creation of a number of public and semi-public outdoor spaces, the site becomes more welcoming as a community hub.

On the North elevation, the iconic barley malt silo clearly stands out from the rest of the building and by restoring the structure while creating a platform for the silo, it became a pivotal moment in creating a sense of arrival and public entrance to the brewery and resto-pub. By having the public experience of the silo before even entering the building, they are not only experiencing the history of the site but also the first step in the brewing process. Finally, alongside the silo is a hydroponic green wall with built-in green boxes on one side and vines on the other, allowing for a different experience when entering and leaving the building. This hydroponic vertical wall beautifies the exterior of the brewery while also emphasizing sustainability and re-greening in an area that lacks greenery overall. Details of the green wall's construction can be seen in Figure 111.

Figure 110:
North Elevation of the renovated Northern Brewery complex.

Detail Sections

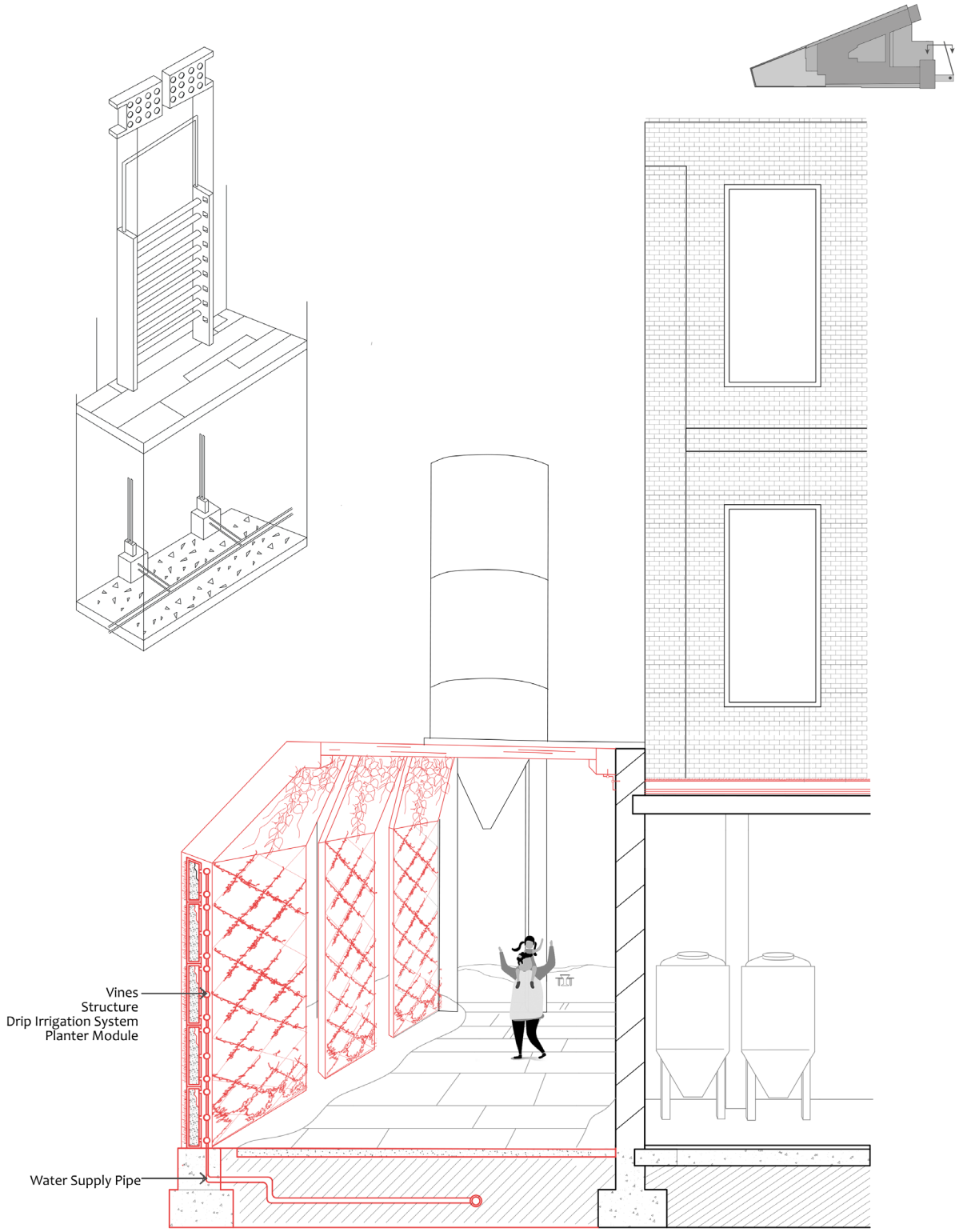


Figure 111: Detail drawings of the green wall.

Main Entrance to Brewpub

Figure 112: Interior render of the main entrance to the renovated Northern Brewery complex.

West and East Elevations

West Elevation

East Elevation

Figure 113:
West and East Elevations of the renovated Northern Brewery complex.

Parametric Brick Wall

The parametric brick wall serving as a screen around the green roof, both celebrates the old techniques of brick construction and the predominant material palette of the host building, while expressing contemporary techniques. Overall, the wall is meant to act as a bridge that connects the original building with the repurposed structure. The design of the parametric brick wall allows it to act as a protective screen around the roof garden that filters light, offering privacy from the main street below and heightening the pleasure of using the sitting areas. As well the bricks are placed at different depths to create a 3D effect that creates different patterns of shadow at different times of the day, which are more visible from the street. Due to these factors, users will have a different experience of the parametric wall depending on how they interact with the Northern Brewery and their elevation. This wall also celebrates the past by repurposing the original bricks from the parts of the building that were demolished in the course of the adaptive reuse intervention and shows how architecture connects to the community by reflecting the environment that the community resides in.

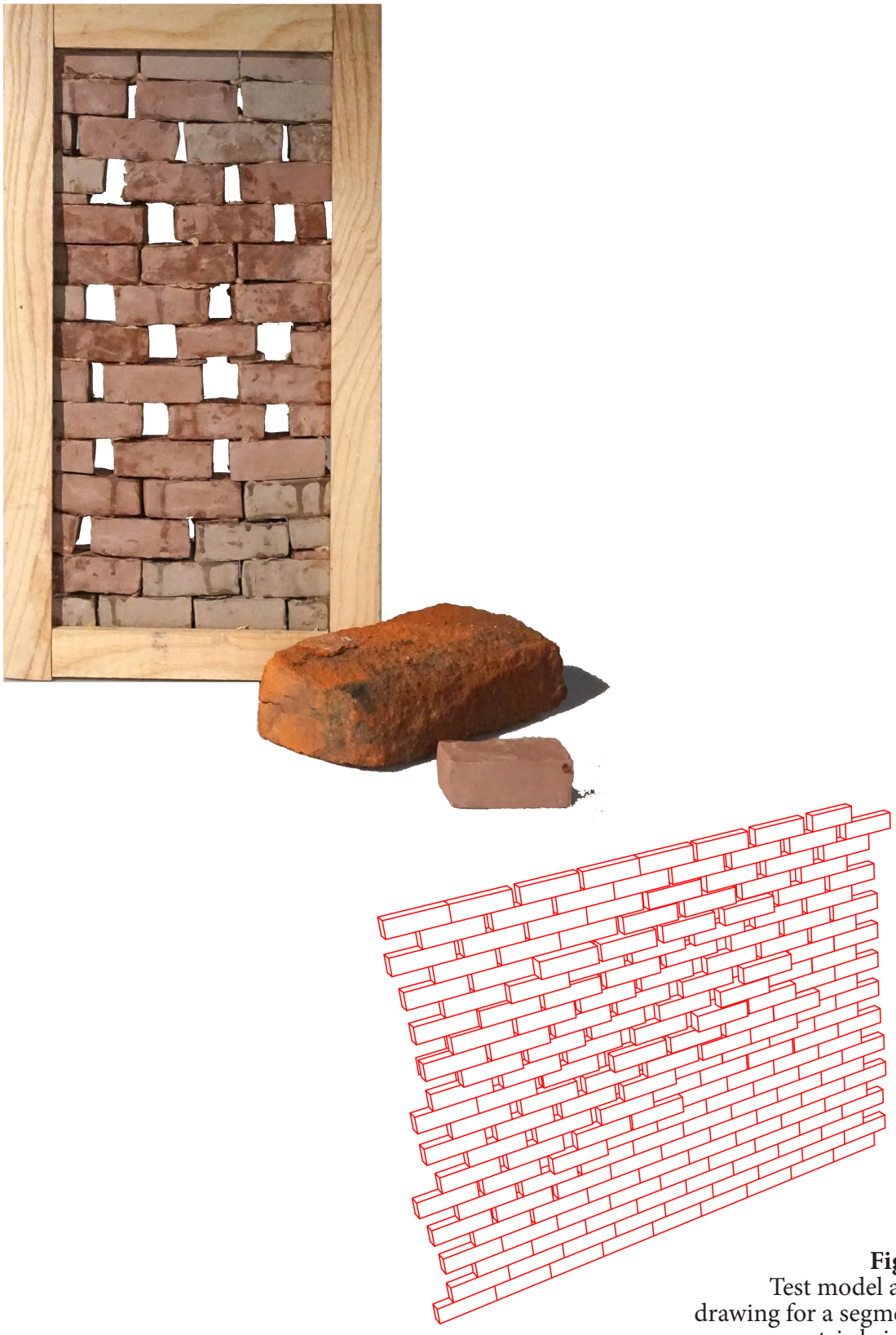
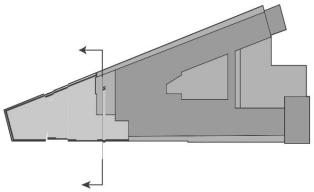


Figure 114:
Test model and detail drawing for a segment of the parametric brick screen.

Glulam Construction



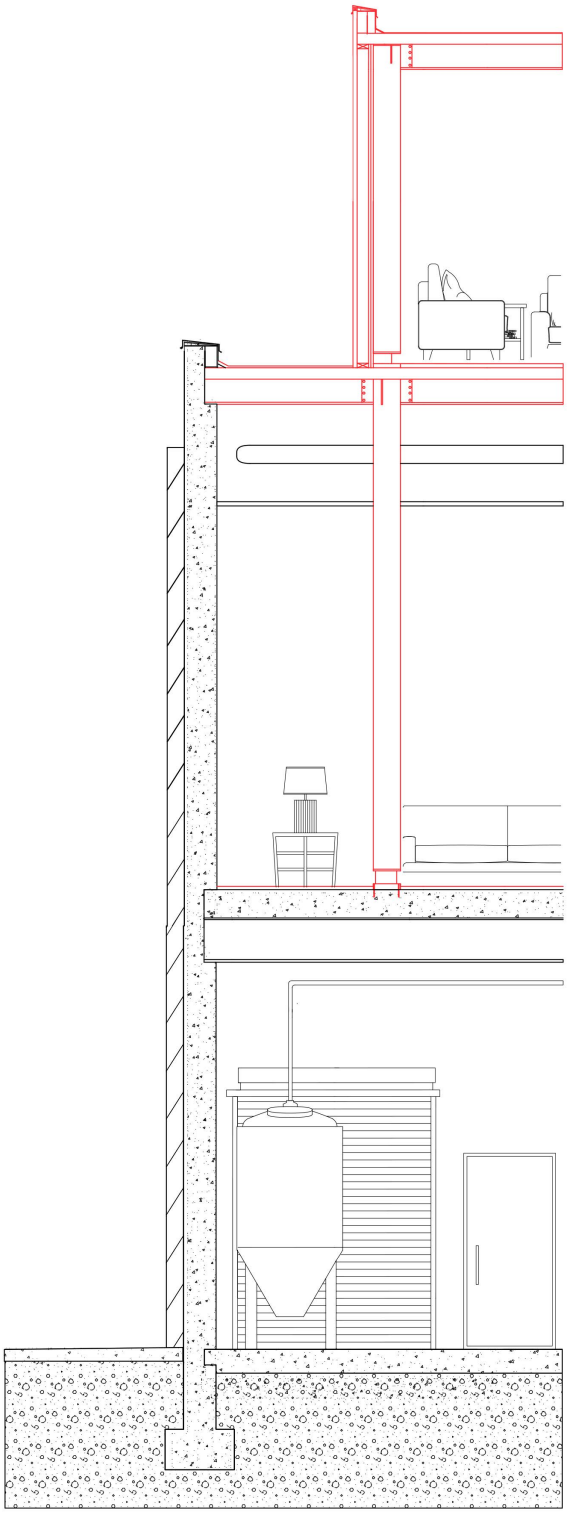


Figure 115: Section through existing reinforced concrete and brick, and new glulam construction.

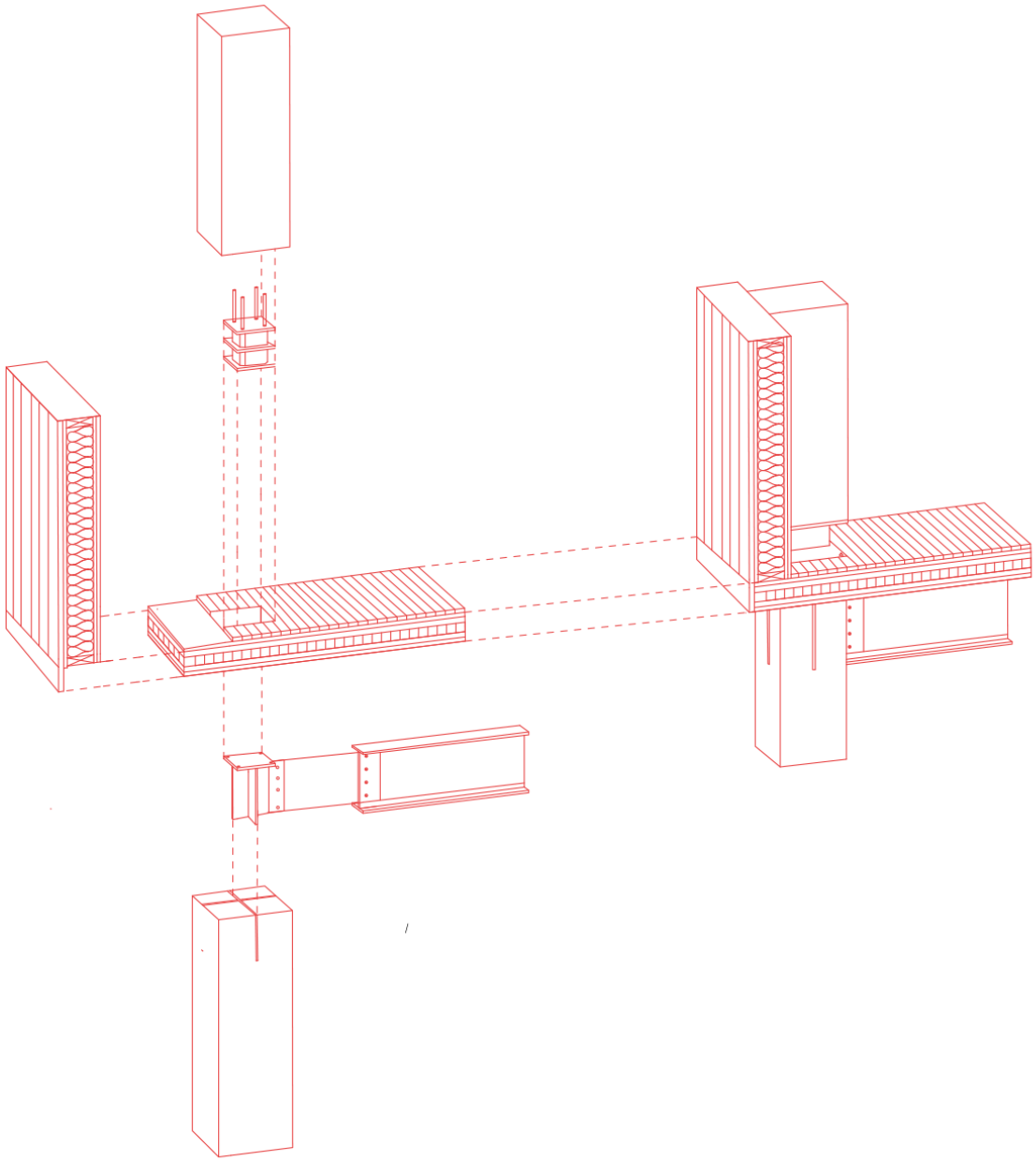
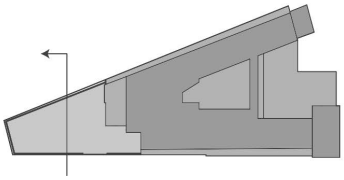


Figure 116: Exploded axonometric of glulam construction of the renovated Northern Brewery complex.

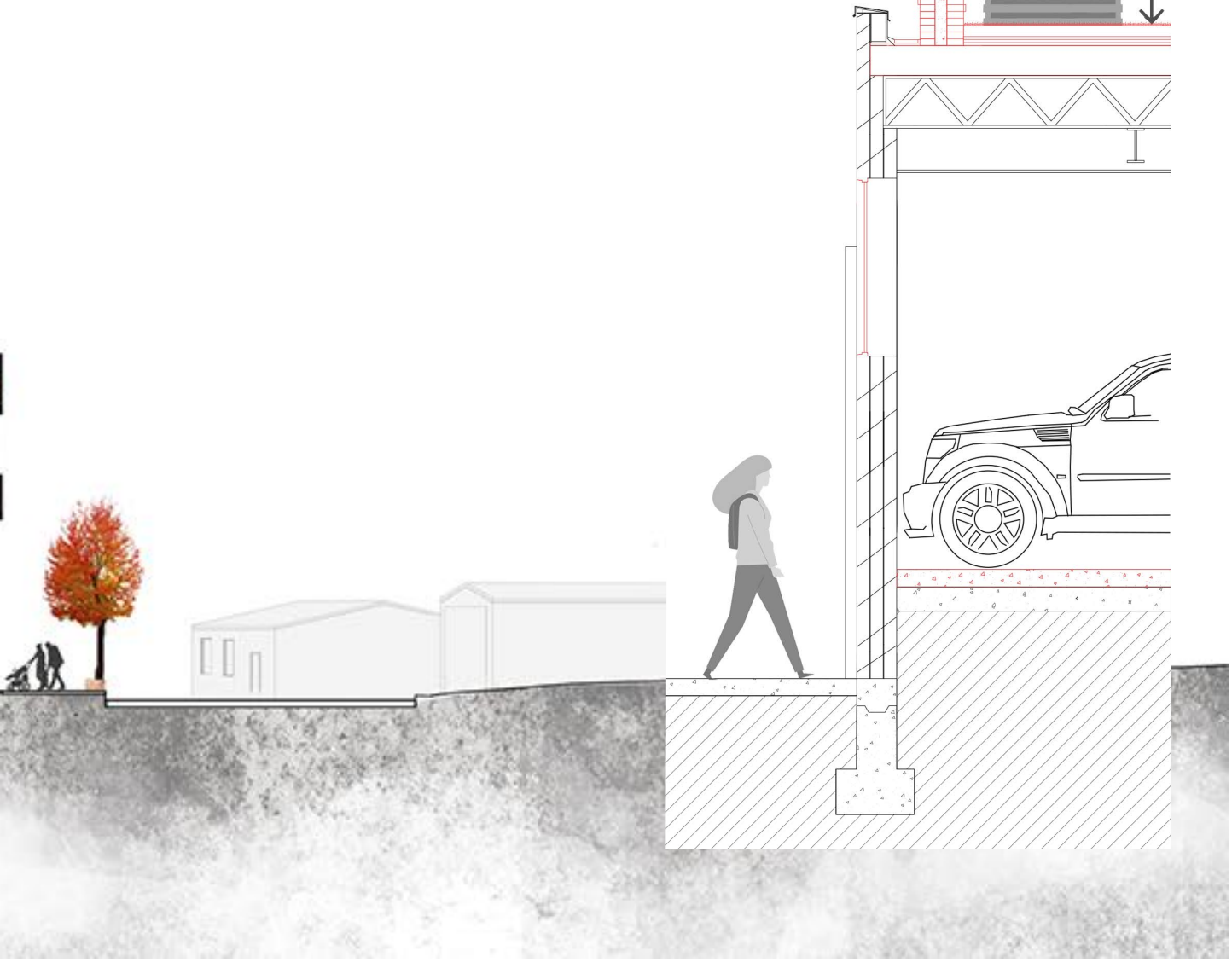
East-West Section and Detail Section

Materiality plays an important role in the adaptive reuse of the Northern Brewery. Through peeling away the many layers of the interior it allows for the original brickwork to show its true form. On the exterior, many of the pilasters and edges of the facade are restored to the original quality found in the early 1900s. Complementing the reinforced concrete and brick infill and cladding of the host structure, my adaptive reuse intervention adds wood to the material palette. This not only offers a more readily legible contrast between old and new, but also brings warmth to what was an otherwise cold industrial complex. The interior structures of the second and third floor aare constructed with glulam beams and columns. The exterior elevation of the third floor uses longboards to extend the use of wood to the building's exterior. In Figure 115, one is able to see the construction detail of the glulam meeting the original structure. As well in Figure 117, the new construction (which is outlined in red) represents which parts of the building are new construction.

Figure 117:
East-west section and detail section of the renovated Northern Brewery complex.



Plants
Growing Material
Filtration
Drainage and Water Retention
Roof Barrier
Water Proof Membrane
Roof



Communal Space for Residents

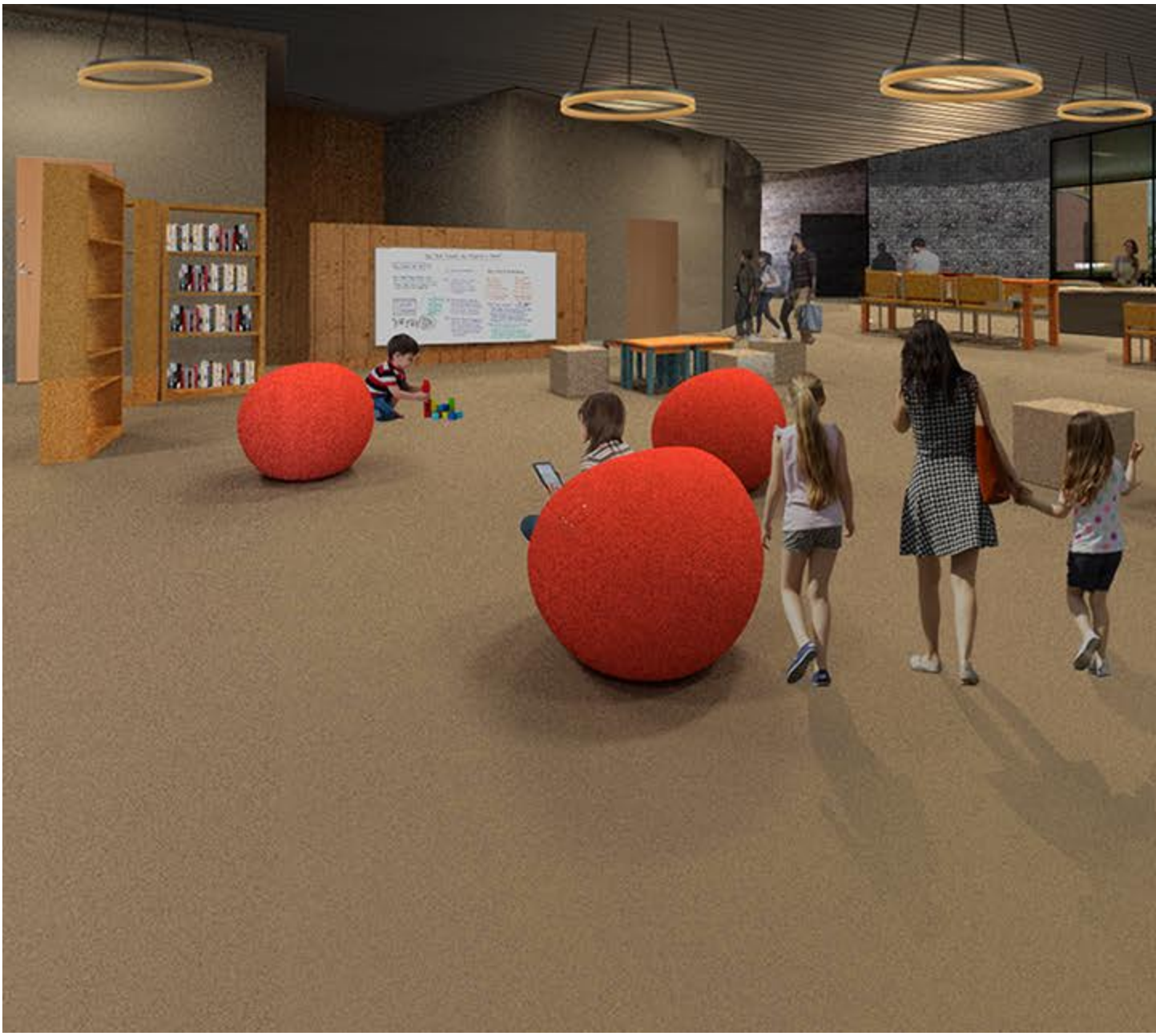


Figure 118: Interior render of communal space on the second floor of the renovated Northern Brewery complex.

Conclusion

Through the use of inviting landscaping throughout the site as well as the specific adaptive reuse strategy that prioritizes the collective memory of the site's local history, the Northern Brewery is envisioned as a place that reconnects to the community and fosters inclusion in an otherwise depressed part of the city. These attributes are reflected throughout the building and its variety of programmes, such as the restaurant and affordable housing. Collective memory as a strategy allows for a new programme, such as in the Northern Brewery, that is better suited to a changing world while still maintaining the essence of the original building, people and memories that reside there in order to better connect people through unified understandings of the space and one another's local history. This adaptive reuse strategy can be utilized as a response to numerous issues faced by communities, including those that are physical, ecological, cultural and socioeconomic. In the case of Sudbury, it was a critical response to the high level of homelessness and lack of affordable housing as well as the insufficient amount of public green space which contributed to the revitalization of the host building into mixed income housing and the use of sustainable methods and additions to the site.

Analyzing and utilizing adaptive reuse as a method of connecting and being attuned to the needs of the city of Sudbury in this thesis developed further insight into how a connection to community, re-greening spaces and addressing issues at different levels, including economically, can change the way a specific site and area are perceived. The area of the Northern Brewery is similar to that of many other cities that are de-industrializing, as it is filled with obsolete industrial buildings that are in a derelict zone that suffer from urban challenges of unsafe neighbourhoods, socioeconomic segregation, and environmental degradation. Through implementing similar strategies found in this project of adaptive reuse, such as creating inclusive spaces and developing networks of greenery, these defunct industrial buildings can bring new life to cities and downtown cores as they will be projects of regeneration. The Northern Brewery is an example and can be translated to other urban centres around the world as it shows that by working with and for the local community, being sustainable, and creating spaces where all feel safe results in the first steps of a better city and a stronger community.

Endnotes

1. Susan Margret Morse, "Traveling through time: Discourses of memory, self and the collective" (Ph.D. diss, University of California, Irvine, 2006), 40.

2. Matteo Robiglio and Donald K. Carter. *RE-USA: 20 American Stories of Adaptive Reuse, a Toolkit for Post-industrial Cities* (Berlin: Jovis Verlag GmbH, 2017), 222.

3. Susan Margret Morse, "Traveling through time," 40-41.

4. Graeme Brooker and Sally Stone, *Rereadings: Interior Architecture and the Design Principles of Remodelling Existing Buildings*, 125-134.

5. Ibid, 125-134.

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